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Number 6.

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and Industrial Record.

1900 EDITION

TEXTILE WORLD'S

OFFICIAL DIRECTORY

OF THE

Textile Manufacturers of the United States.

448 PAGES. 22 MAPS.

Price, $2.00.

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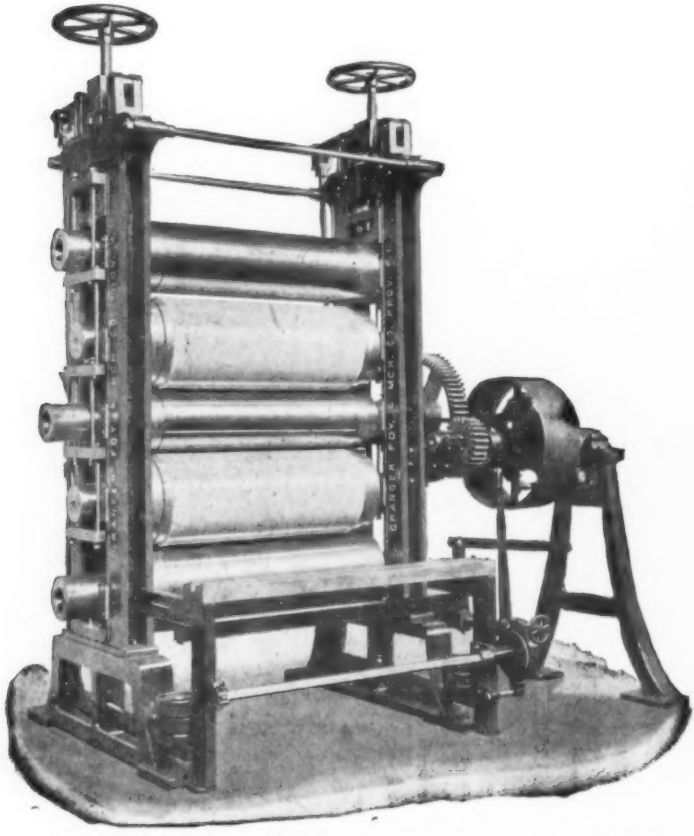
GUILD & LORD,
PUBLISHERS.

620 ATLANTIC AVENUE,
BOSTON, MASS.

Bleaching, Dyeing, Drying,

And Finishing Machinery.



CALENDERS, MANGLES AND ROLLS.

TENTERING MACHINES,
MERCERIZING MACHINES.

Granger Foundry and Machine Co.

PROVIDENCE, R. I.

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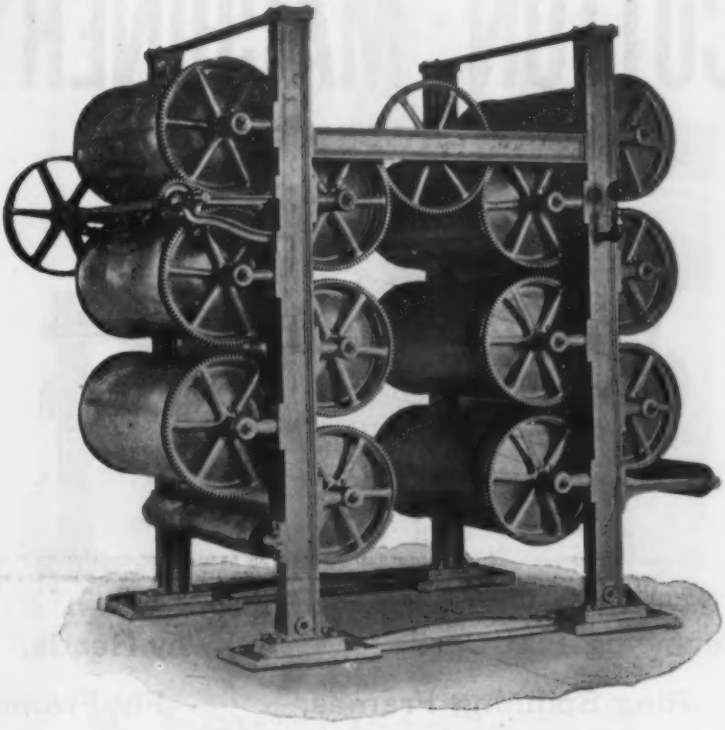
For Textile Fabrics



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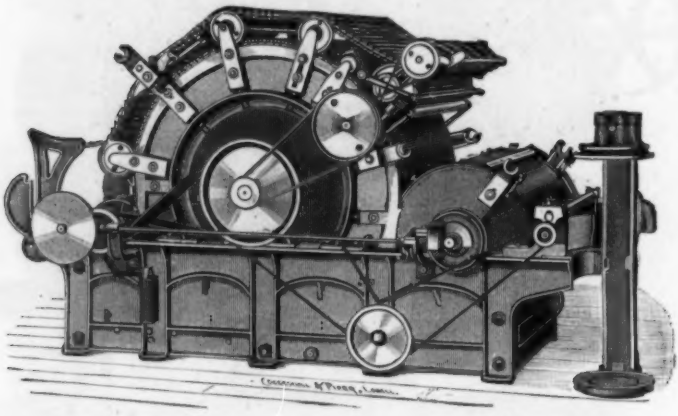

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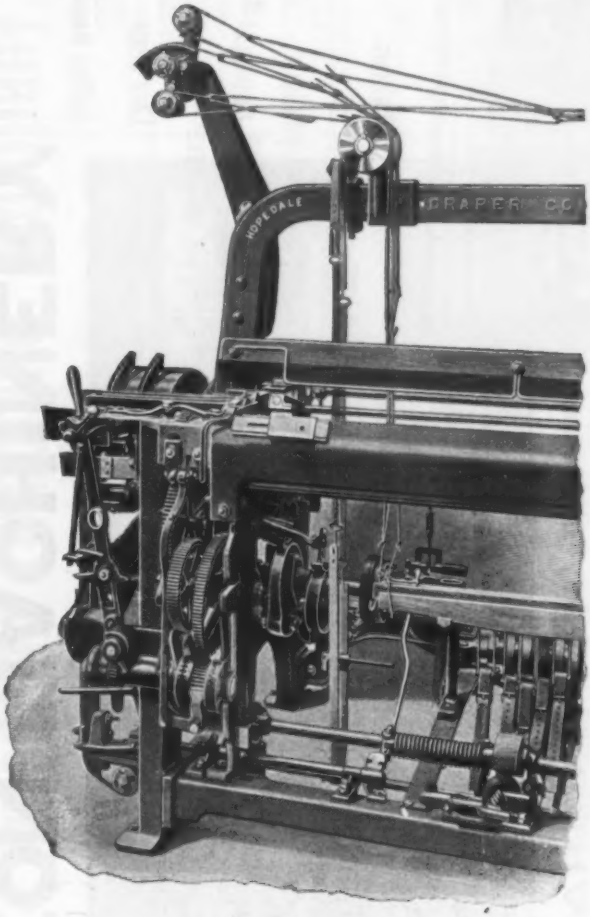

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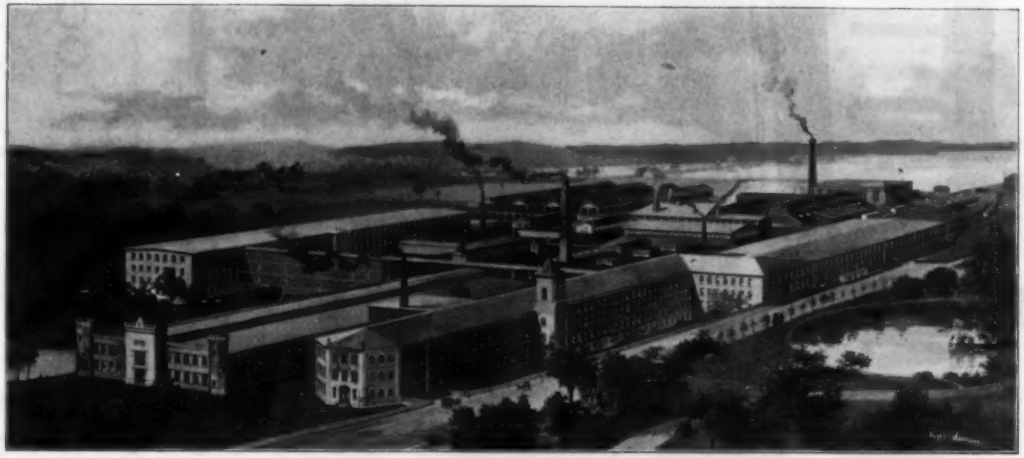

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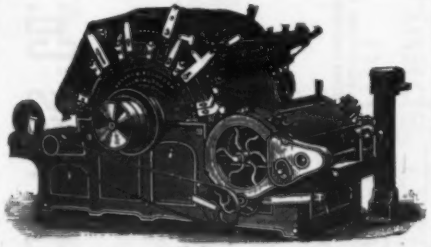

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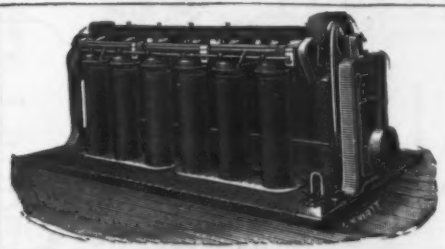

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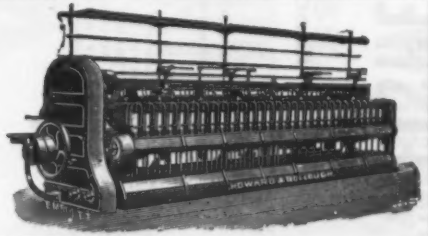

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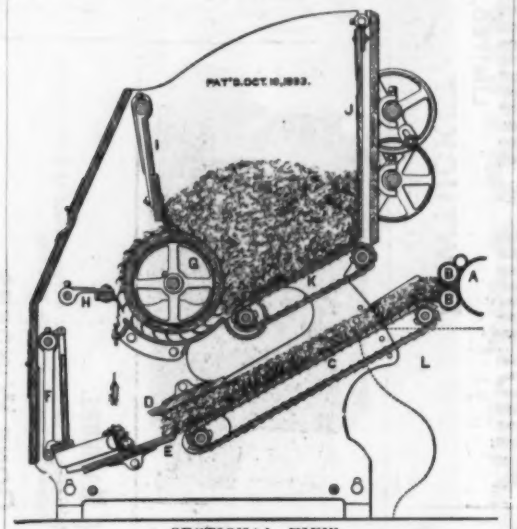

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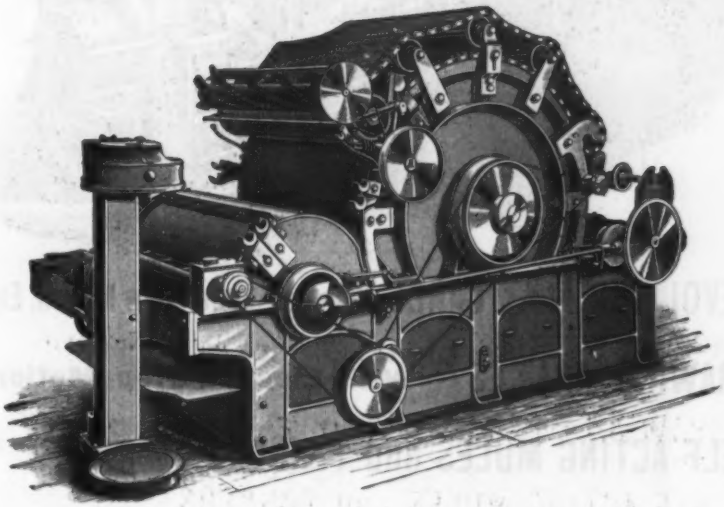

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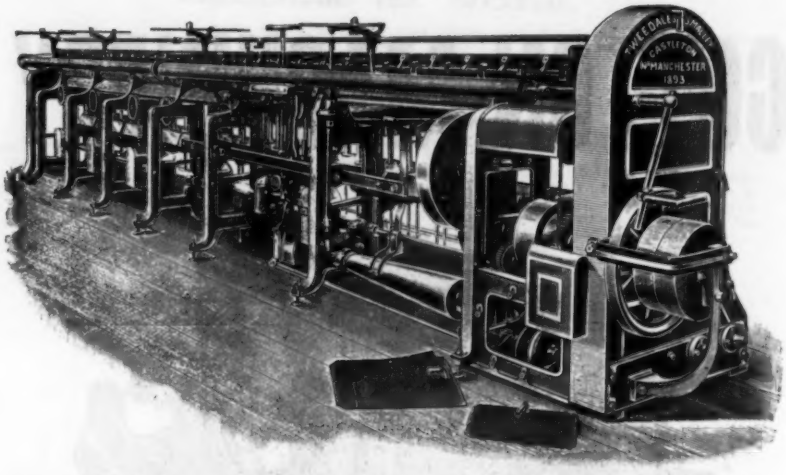

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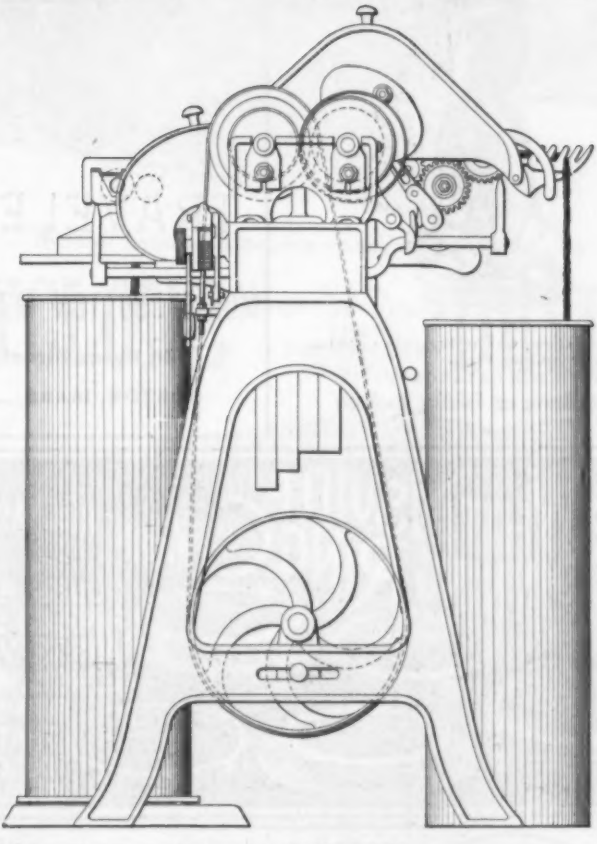

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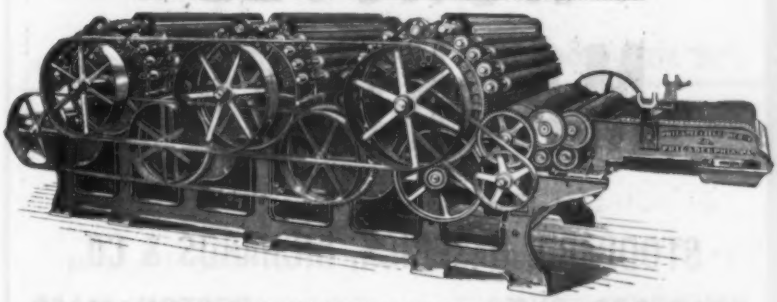

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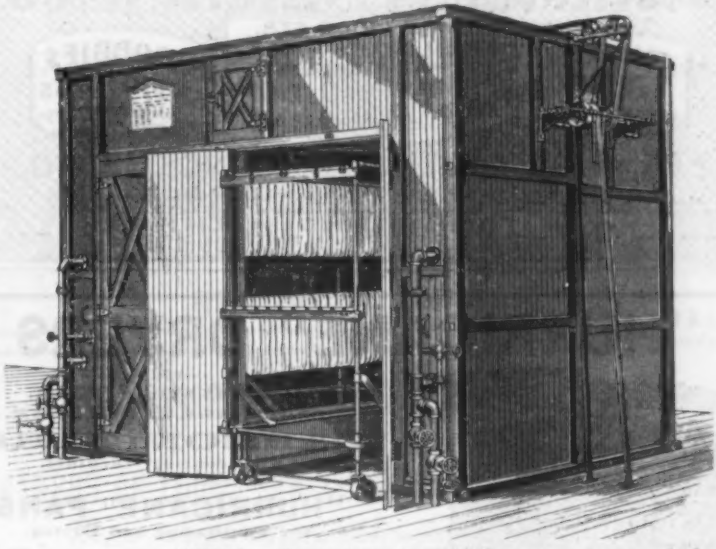

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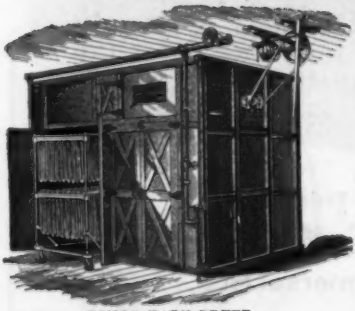

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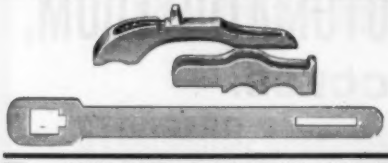

The weight can be taken off and put on to the middle rolls, without stopping your frames, when long staple cotton is used.

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No bent stirrup resting on rolls.

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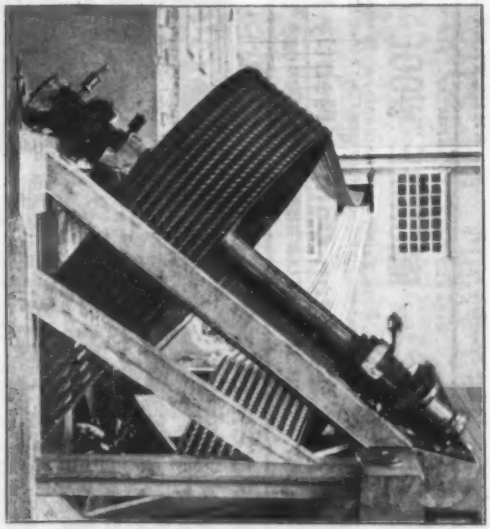

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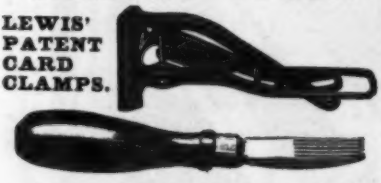

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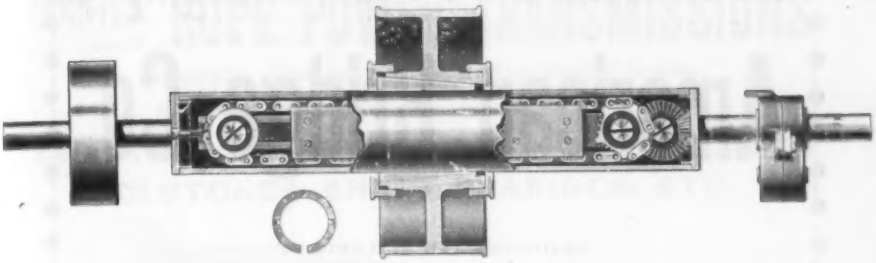

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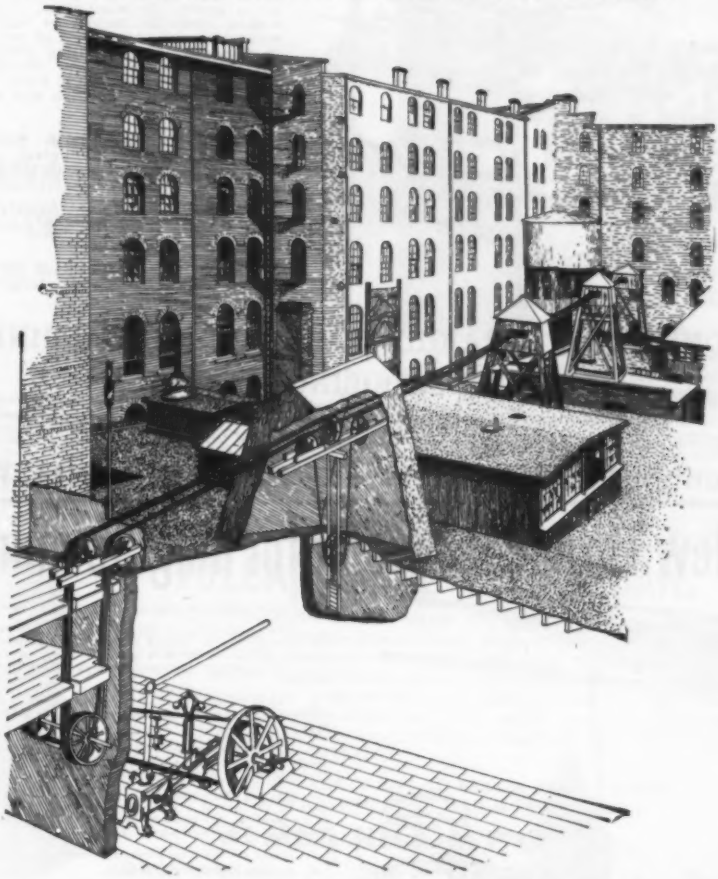

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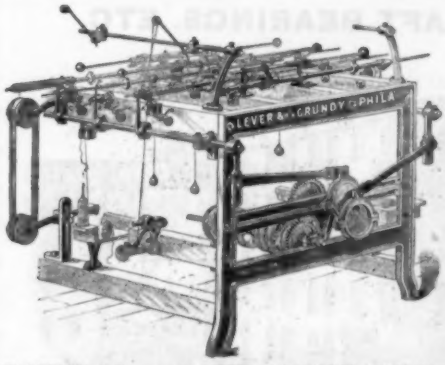

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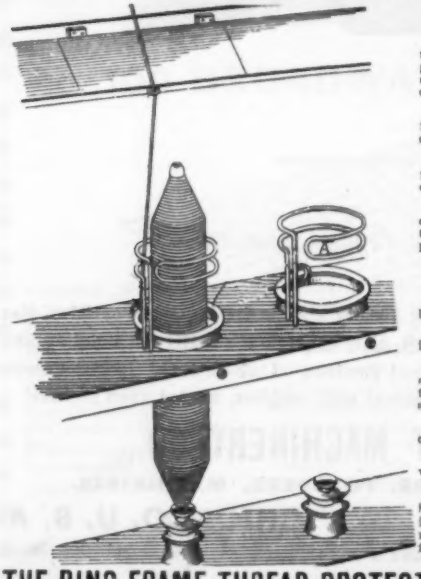

The following advantages are claimed for this protector

1. The speed of the frame will be increased, and also the production on frames without any protectors or plain separators about twenty five to thirty per centum, and on frames with separators about twelve or fifteen per centum.

2. The threading and consequent imperfection and inferiority of yarn and cloth, occasioned by the use of blade separators is entirely obviated.

3. The traverse of the rail can be increased from one-fourth of an inch to one inch, if frame permits, thereby enabling the use of longer bobbins

4. The life of the traveller is prolonged fully fifty per cent on account of a more even tension being imparted to the traveller, the same being held in a perpendicular position at all points of the traverse,

5. Frame and rail more perfectly balanced.

6. Heavier travelers can be used.

7. The yarn is wound tighter and more uniformly on bobbins.

8. A material saving in time of doffing, as more yarn is wound on, and longer bobbins can be used.

9. Saving of time of the operator on account of fewer ends breaking, thereby increasing the quality of yarn, and the operator can attend many more spindles in consequence.

10. The life of the ring will be prolonged on account of decreased friction.

11. No accumulation of lint, dust and dirt, which invariably results in the use of blade separators.

The above results have been obtained in the mills of S Sanford & Sons, Carpet Manufacturers, Amsterdam, N.Y. in whose mills the protectors have been in use on all spinning frames since October, 1899, and by permission we refer to said firm for a confirmation of our claims.

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List of Textile Patents.

Issued Nov. 6, 13, 20 and 27, 1900.

Bleaching-Keir. 661,295. C. Rigamonti and Giovanni Tagliani, Milan, Italy.

Card Clothing, Machine for Making. 662,469. L. C. Schneider, Mittweida, Gy.

Card Grinding Machine. 662,742. B. S. Roy, Worcester, Mass.

Carding Apparatus, Wool. 662,733. H. L. Offermann, Leipsic, Gy.

Carding-Engine Revolving Flats, Mechanism for Slipping Teeth of. 662,581. H. Walsh, Oldham, Eng.

Cop-Tube. 661,151. W. J. McCausland, Camden, N. J.

Cop-Tube Making Machine. 661,152. W. J. McCausland, Camden, N. J.

Cotton Press. 661,349; 661,350. Chas. E. Mallett, New York, N. Y.

Cotton Waste, Treating. 661,166. R. R. Boyd, Memphis, Tenn.

Dyeing Apparatus. 662,281. W. Mather, Manchester, Eng.

Dyeing Apparatus. 661,343. J. Hussong, Camden, N. J.

Dyeing Apparatus. 661,633. H. W. Boettger, New York, N. Y.

Fabric Strength Testing Device. 662,327. W. M. Vermilye, New York, N. Y.

Fabric Treating Apparatus. 661,289. A. Garland, Howell, Mich.

Hackling Machine. 662,117. Joshua V. Eves, Belfast, Ireland.

Knitting Machines, Presser for Spring Needle. 662,268. F. Hammond, Paris, Can., assignor of one-third to the Penman Mfg. Co., Ltd., same place.

Knitting or Like Machines, Driving Means for. 662,159. F. Wilcomb, Norristown, Pa.

Loom. 662,320. E. S. Stimpson, Hopedale, and W. I. Stimpson, Milford, Mass., assignors to the Draper Co., Portland, Me., and Hopedale, Mass.

Loom Beam Attachment. 662,029. C. R. Saatweber, Paterson, N. J., assignor of one-half to G. W. Renkel, same place.

Loom Driving Mechanism. 661,264. A. A. Gordon, Worcester, Mass., assignor to the Crompton & Knowles Loom Works, same place.

Loom, Filling Supply. 662,441. O. Janelle, Manchester, N. H., assignor to S. N. Bourne, Trustee, same place.

Loom, Needle. 662,717. W. V. Gee, Philadelphia, Pa., assignor to Schaum & Uhlinger, same place.

Loom for Weaving Textile Fabrics. 661,715. W. Garlick, Ashton-on-Mersey, England.

Loom Picker Check. 661,083. D. W. Shirreffs, Oswego Falls, N. Y.

Loom Shuttle Actuating Mechanism. 662,741. B. S. Roy, Worcester, Mass.

Loom, Shuttle Changing. 661,752. H. Wyman, Worcester, Mass., assignor to The Crompton & Knowles Loom Works, same place.

Loom Shuttle Check. 661,665. J. P. Maloney, Woonsocket, R. I.

Loom Warp Stop Motion. 661,161. C. Whitaker, Tyngsborough, Mass., assignor to Lowell Mch. Shop, Lowell, Mass.

Napping Machine. 662,589. R. C. Borchers, Philadelphia, Pa.

Spinning Machinery Drawing Rolls, Covering for. 661,644. W. F. Reid, Addlestone, Eng., assignor to the Velvril Co., Ltd., London, Eng.

Warping Machine. 661,268. C. H. Knapp, Paterson, N. J.

Washing Machine, Piece. 662,377. C. C. Kenyon, Raritan, N. J., assignor of one-half to David R. Kenyon, same place.

Weaving, Harness for Cross. 661,656. W. B. Dixon, Philadelphia, Pa.

Woven Fabric. 661,640. A. Heald, Philadelphia, Pa.

Yarns, Machine for Humidifying. 661,940. J. T. Pearson, Burnley, Eng.

Patents and Patent Causes.

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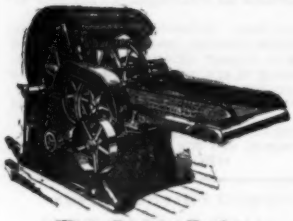

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The Picker discharges from the back underneath.

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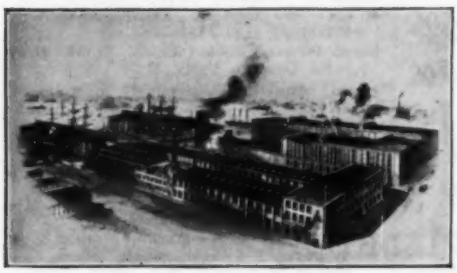

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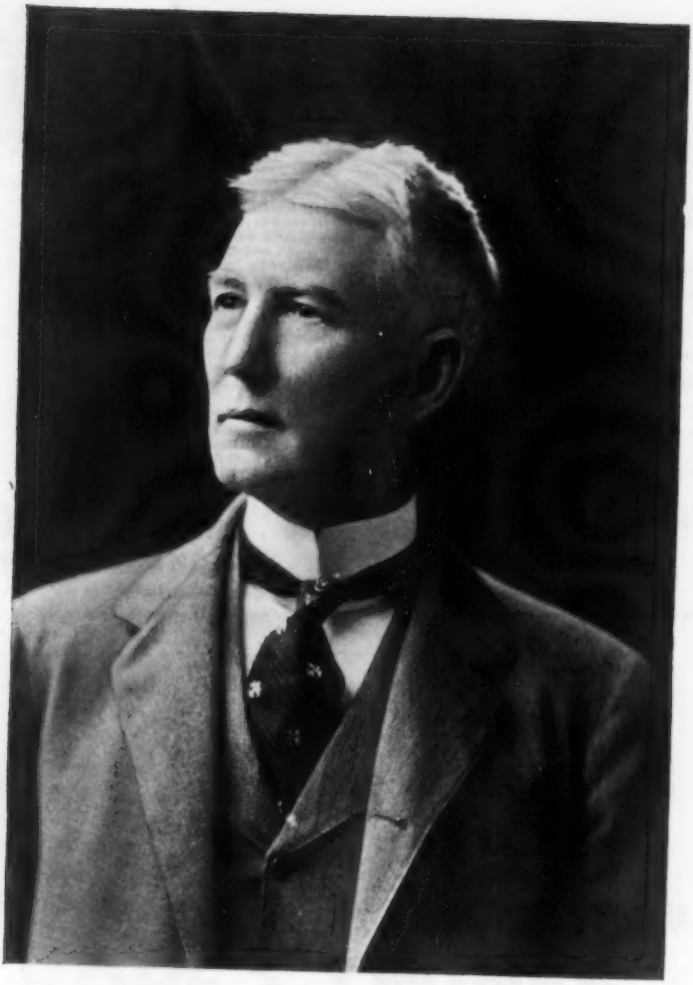


WM. J. KINCAID.

TEXTILE WORLD.

Vol. XIX. DECEMBER, 1900. No. 6.

WM. J. KINCAID.

William Joseph Kincaid was born on a farm, in Burke County, N. C., January 3, 1841. His father was of Scotch-Irish, and his mother of Connecticut Yankee, descent. He attended the Old Field country school, and later, at the age of eighteen, completed his education at the Rutherford Academy. When fourteen years of age, he entered a village store as a boy of all work, and during the next six years was employed as a clerk in this store, clerk in a hotel, attended the Rutherford Academy, and teaching a country school for six months.

At the beginning of the Civil War, he volunteered in the first company that left his county, on April 18, 1861, taking up arms in the defence of the cause which he believed to be right, that of his State. He was appointed orderly sergeant of Company G, First North Carolina Volunteers. Seven months later, his regiment was reorganized, and he assisted in raising Company D, of the 11th North Carolina Infantry, and was appointed its first lieutenant. He served in this position until the battle of Gettysburg, in which he was badly wounded. After this battle he was promoted to captain of his company.

When Lee's army retired, Capt. Kincaid's wounds were so serious as to prevent his removal to Virginia, and he was taken prisoner by the Union forces and sent to the U. S. hospital at David's Island. Four months later he was removed to Johnson's Island, Ohio, where he remained for sixteen months. Later he was transferred to Point Lookout and Fort Delaware. He remained a prisoner until the end of the war.

When the war closed, and the troops were disbanded, Captain Kincaid found himself entirely without means, and he accepted the first position that was offered, finding employment in a jobbing house in Baltimore, Md. A year later, in 1866, he opened a general store at Wilson, N. C. He had little capital to start with, and the little that he had was furnished by a silent partner, who recognized the ability of the young man, and had confidence in his integrity. That this confidence was not misplaced, is conclusively proven by the fact that at the end of five years Mr. Kincaid had accumulated $20,000 out of the profits of the business, besides paying his partner about the same amount.

In 1871, he moved to Griffin, Ga., and there was engaged in the mercantile business until 1883. He recognized the possibilities of industrial development in the South, and saw clearly the great field which that section offered for manufacturing cotton goods. With this foresight and good judgment, he combined the necessary courage, and in 1883 sold out his business and organized the Griffin Manufacturing Company, a stock company for the manufacture of cotton cloth. This enterprise was so successful that five years later he organized a second company, and built the Kincaid Mill, which met with similar success, and in 1899, he built the Spalding Cotton Mills. These mills are all in success-

ful operation, and Mr. Kincaid is president of each.

He has been one of the pioneers in building cotton mills run by steam in small towns, and his marked success has contributed in great measure to the promotion of similar enterprises throughout the South.

Capt. Kincaid's life is one long example of duty faithfully performed. His career is one that he can well be proud of. As a young man, he laid the foundation of his later success in life by energy, industry, and close attention to business. At the breaking out of the Civil War, he promptly took up arms and fought bravely in the defence of his state, and at the close of that contest he accepted the result without a murmur, and went to work to win victories in the industrial contest in which the South has since so greatly distinguished herself. Today he is in charge of the large business interests which he founded and organized, and is a worthy representative of Southern cotton manufacturers, who constitute such an important factor not only in the cotton industry of this country, but also of the world.

THE DRAW BACK LAW.

The framers of the present tariff law to protect the higher wages and better conditions of living in the United States from the competition of foreign manufacturers with their low wages, recognized that this principle of protection could not be consistently withheld from the grower of wool and given to the manufacturer of woolens. Both were protected, and as intended, the result has been to ensure the home market to our own mills, maintain the higher rate of wages, and raise the price of wool about seventy-five per cent.

This high protection, while ensuring the home market to our own mills, rendered it impossible for our woolen goods to be sold outside of our own country, where they meet the low priced fabrics made by poorly paid labor from cheap raw material. The tariff wall which keeps foreign goods outside is equally effective in keeping our own woolen goods inside. The framers of the Dingley laws recognized this fact, and endeavored, in respect to raw material, to give our woolen mills a chance in foreign markets. This attempt was made by inserting a draw back section in the wool tariff, which provides that if goods manufactured from imported wool be exported from the United States, the government will pay back ninety-nine per cent. of the duty on the wool used in making the exported goods.

The operation of a draw back law must be accompanied by necessary regulation to prevent fraud. Whether or not these regulations must be of such a character as to make the draw back law on wool of no practical benefit is yet to be proved. The law has been availed of to but a very limited extent. During the year ending June 30, 1899, wool duties amounting to $34,971.07 were paid to exporters under this draw back law.

It is an open question whether we could sell woolen goods abroad, even if we had free wool. The need of more work for our mills, however, calls attention to this question, and if our manufacturers desire to try the experiment, there is the draw back law enacted for their benefit. It is not free wool, to be sure, but as near as we can get to it.

The law provides that the imported raw material must be in such a form in the finished product as to be readily distinguished. Under this provision, it would be impossible to secure a draw back on imported wool which had been mixed with domestic raw material in the process of manufacture. On certain staple goods, composed wholly of imported wool, or of domestic cotton yarn and woolen or worsted yarn from imported stock, it might be possible for manufacturers to avail themselves of this law.

MILL DISCIPLINE.

The object of mill discipline is to secure the highest efficiency of each individual, and also the whole body of employees acting as a unit.

When work is being done by one man for himself alone, the question of discipline is one of self control. He decides what is best, and does it to the best of his ability. When the job becomes too large for him, and others are called in to assist, that something which we call discipline becomes necessary.

The singleness of purpose and unity of action of the one man must be supplied to the number, and some means must at the same time be devised to make the knowledge, judgment and experience of each individual as available for the general good, as was the knowledge, judgment and experience of the one man for his own good. The complete attainment of these objects, in other words, the ideal discipline, is impossible. The best system is the one that comes nearest to it.

The unity of purpose and action must necessarily be supplied by giving one man authority to direct the work of the others. This is self evident, and admits of no discussion.

Converting the knowledge and skill of each individual into common property is more difficult, but not less important.

It will readily be granted by all that no man should be placed in authority who is incompetent, either by lack of experience, training or natural ability. It will also be generally admitted that this centralized authority should be given to but one man. "One poor captain is better than two good ones."

Having secured the competent manager, and having given him the necessary authority, it only remains to hold him strictly responsible for results. He must be left free to act as he may think best for the interests of the mill.

So far, we have referred only to the one highest in authority. The management of industries employing a large number of hands in various processes, means that the head man in authority must employ subordinates to whom is given authority over certain departments. To these subordinates, whether called superintendents, overseers, second hands or what not, the same principles apply that we have mentioned in connection with the central authority, the only difference being that the sphere of action is smaller. This necessitates the limits of authority being exactly defined. When this is done, a competent man should receive full authority in his department, and be held responsible for results.

So far, we think there will be slight dissent from our views. The difficulty is not in knowing what should be done; it is found in making practical application of the recognized principles.

In actual practice, we find men holding positions of responsibility in our mills, but deprived of some or all of the essentials we have named. He may be competent, and lack authority. In that case, knowing what is right, he sees what is wrong without the power on his part to apply the remedy.

Or, his duties and responsibilities may be but vaguely defined, a condition in which either he comes in conflict with others in authority, or else some part of the work is neglected and left with no one in authority to look after it.

Owing to the vast detail involved in textile manufacturing, the work is subject to numerous defects and difficulties that call for an immediate remedy as soon as discovered. Delay in correcting a fault often means heavy loss. In a properly disciplined mill, when the work is subdivided among men who know their place, have the necessary knowledge and authority, and feel their responsibility, short work is made of most difficulties as they arise.

In such a mill, there is peace of mind on the part of each competent employee who knows his place and what is expected of him, a condition most

conducive to the realization of the second object of discipline, namely, making the knowledge and skill of each individual available for the general interests of the enterprise.

Every textile manufacturer knows the value to the mill of the knowledge acquired by his subordinates in their daily contact with the processes of manufacture. He knows how much it would help production, quality and cost, if each employee did his best, and gave his superiors in authority the benefit of his knowledge. To attain this result, many schemes of profit-sharing have been tried. Such schemes are open to objections under the most favorable conditions, and are totally ineffective if a business is unprofitable, and consequently in the greatest need of the best efforts of each employer. They fail to give each individual the reward for his own work. All share alike irrespective of varying degrees of merit.

Mill discipline should be such that each employee would receive such reward in the way of promotion, or recognition, as his services merit. Praise, if deserved, should be administered as freely as deserved blame.

There are about 700,000 people in the United States engaged in manufacturing textiles. No two of them are alike in capacity or disposition. It is for the employer or head manager to study the conditions in his own mill, and apply rigorously the correct principles of discipline.

Engage competent men. Define their duties. Hold them strictly responsible. Use them right, and see that they use others the same way. If at fault, talk to the offender alone. Don't encourage insubordination by interfering with those under the authority of your overseers or superintendents. Let the work of hiring or discharging help be done by the one next in authority. Let your employees know what you want, and then leave them alone while they are trying to do it. Avoid anything that would lead an employee to think that he could safely disregard the orders of his immediate superior. See that no injustice is done to any one of high or low degree. Use common sense. Don't expect others to be nearer perfection than you are.

WOOL MARKET.

Graphic Chart of Fluctuations in Wool Values brought up to date.

During the week or ten days previous to the election, the market strengthened perceptibly, and there was a marked increase in the volume of business. This rise and activity proved to be a complete discount of the result of the election. The market has since held its own, and that is all

that can be said. There are plenty of tired holders ready to sell at current prices. Many of them have been holding wool for a year on a declining market. During that time, they have seen quotations on fine medium territory drop from 62 cents (the top of the boom) down to 45 cents, near where it is now.

During the last five or six months, these owners of wool have been looking to election day to mark the turning point of the long and steady decline. But, no marked rise has taken place, because there are too many wool men anxious to unload, and because there has been no increase in the consumption of wool.

It is becoming plainer as time passes, that the use of wool has been greatly restricted during the past two years, on account of the increase in price. After manufacturers had become accustomed to buying fine medium scoured wool at 30 cents, they looked at 40 cents as high for the same grade. The people who were paying $10 for a suit, declined to pay any more after wool went up, and the result has been to increase the use of cotton and shoddy for men's wear goods.

This is a natural process, and will be repeated as often as a misguided trade sends the price of a commodity above a fair price. The failures in the wool and wool commission trade have depressed the market, rendering dealers and bankers more cautious. Mills are starting up to fill the few orders for light weights, but the business is not calling for any large purchases of raw material. Conservatism is apparent on all sides. The foreign markets for wool and woolens show little, if any, improvement.

The sales of wool in Boston for November are reported at 22,183,000 pounds, but this does not give any indication of purchases for consumption. These figures are obtained from reports of the different wool houses, and even if correct, the same lot of wool may be counted several times, owing to repeated sales between dealers.

EXPORTS AND IMPORTS OF RAW WOOL, YARN AND WASTE.

Lbs. in units of one million. Value in units of $100,000.

Year Ending June 30.	Exports.		Imports.					
	Wool.		Wool.		Shoddy, noils, etc.		Yarn.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
1890	.231	.335	106.3	152.6	5.0	20.5	3.5	19.9
1891	.291	.394	129.3	182.4	1.2	4.3	2.0	11.9
1892	.202	.306	148.7	196.9	.3	.9	1.3	7.5
1893	.091	.148	172.4	210.6	.3	1.1	1.2	6.9
1894	.520	.906	55.2	61.1	.1	.5	.5	3.6
1895	4.289	4.844	192.8	229.9	14.1	19.8	2.4	11.7
1896	6.945	8.559	228.4	315.0	18.7	26.5	2.0	10.5
1897	5.271	6.199	366.6	567.5	49.9	69.3	1.8	9.6
1898	.121	.180	132.8	167.8	3.3	6.9	.3	1.9
1899	1.6c3	2.373	76.7	83.2	.3	.7	.2	1.1
1900	2.200	3.872	155.9	202.6	.4	.9	.2	1.3
July	.001	.002	7.7	10.6	.017	.059	.018	.132
Aug.	..	..	6.8	9.2	.047	.182	.022	.161
Sept.	..	..	7.2	7.9	.033	.127	.019	.132
Oct.	.106	.113	7.8	7.9	.040	.124	.012	.082

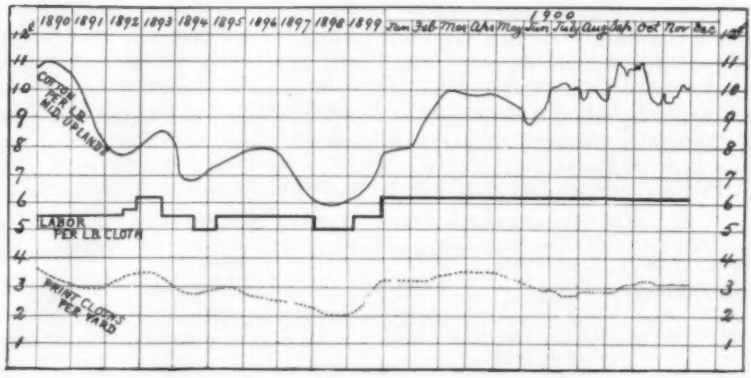
—The practice of weighting worsted coatings has grown to such proportions in England, that a movement is on foot among merchants and manufacturers to secure the prohibition of the weighting, by resort to legal measures, as well as mutual agreement. The Yorkshire, Eng., Post, states that the old and harmless practice of steaming to restore the weight lost by hot pressing, was supplemented some years ago by soaking the goods in solutions of mineral salts, such as sulphates of alum, lead, zinc and magnesia, which increased the weight of a 20 oz. worsted coating to 23 ozs., and it is this last named practice which it is desired to suppress.

EXPORTS AND IMPORTS OF MANUFACTURED WOOLENS.

Value in units of $100,000.

Year Ending June 30.	Exports — Value.						Imports — Value.							
	Carpets.	Dress Goods.	Flannels and Blankets.	Apparel.	Other.	Total.	Carpets.	Cloths.	Dress Goods.	Shawls.	Clothing	Knit Goods.	Other.	Total.
1890	.067	..	.409	3.179	.719	4.374	7.5	161.4	242.0	10.1	18.4	19.8	66.2	525.4
1891	.184	..	.265	4.240	.502	5.191	13.7	120.3	182.4	7.2	18.6	12.5	39.7	394.4
1892	.093	..	.244	2.689	.649	3.675	12.9	127.6	164.7	3.5	14.8	11.6	12.1	347.2
1893	.115	..	.242	2.224	.679	3.260	15.8	151.2	164.8	2.8	11.7	14.1	12.0	372.4
1894	2.500	..	.387	3.172	1.685	7.744	9.6	67.6	85.8	1.6	8.6	10.0	7.2	190.4
1895	1.610	..	.498	3.161	1.432	6.701	13.8	163.0	144·0	2.0	10.0	9.4	11.8	353.8
1896	2.252	..	.370	3.653	2.860	9.135	8.9	218.9	199.3	4.5	13.0	25.4	27.4	497.4
1897	1.895	..	.573	3.858	3.150	9.476	7.8	170.1	167.9	4.6	9.8	25.3	27.0	412.5
1898	1.612	.414	.474	4.290	4.074	10.89	17.9	89.6	60.4	.4	7.6	3.9	9.6	139.4
1899	.811	.169	.427	5.388	3.679	10.47	17.6	39.1	59.1	.5	8.3	6.3	5.6	136.5
1900	1.150	.244	1.002	5.654	4.485	12.54	27.5	51.3	58.7	.8	9.9	5.0	6.3	159.5
July	.076	.004	.038	.429	.488	1.055	3.02	7.25	8.52	.07	.06	.46	.55	19.93
Aug.	.084	..	.146	.726	.726	1.682	2.77	5.85	6.24	.15	1.79	.42	.48	17.68
Sept.	.028	.024	.014	.738	.628	1.432	2.13	2.56	2.34	.06	2.73	.68	.45	10.94
Oct.	.149	.004	.041	.602	.577	1.37	1.68	1.82	2.01	.10	1.50	.49	.41	8.01

COTTON MARKET.


1890 1891 1892 1893 1894 1895 1896 1897 1898 1899
1900
Jan Feb Mar Apr May Jun July Aug Sept Oct Nov Dec
COTTON PER LB. MID. UPLAND
LABOR PER LB. CLOTH
PRINT CLOTHS PER YARD

Graphic Chart of Fluctuations in prices of Cotton, Labor and Print Cloths.

Quotations for cotton during November have been influenced by a constant succession of frosts and rumors of frosts. The frost itself has been light, and nothing has occurred to change the general situation. Receipts have been light, the Southern planter showing great unwillingness to part with his ten-cent cotton.

The heavy shipments to England during the last six weeks has relieved the squeeze there which sent quotations far above the level on this side. Under the influence of lower prices and larger stocks, the English and Continental mills are resuming operations, and face to face with a few hundred thousand bales of new cotton, there is a disposition to turn bear, and view a scarcity of cotton as among the impossibilities.

As our chart plainly shows, the tendency of prices during the month has been upwards. The new crop's appearance in the market has a tendency to depress prices, because it is a factor apparent to all. Its influence is greater than is warranted by the facts. Sooner or later the general conditions will make themselves felt, and among the influences at work to keep prices up, may be mentioned the

absence of any remnant of last year's cotton, and the undoubtedly large quantity of cotton required to clothe the people of all countries.

Present high prices will not perceptibly restrict the use of cotton, as is the case with most other necessities of life when their cost is increased. This is due to the fact that there exists no substitute for cotton. If the cost of wool increases, the people can use cotton. If the cost of cotton is increased, people must still use cotton.

The high price for cotton is adding greatly to the wealth of the South, and this contributes to steady the market, and make prices more uniform. When planters were raising five-cent cotton, and were burdened with debt, borrowing money on their crop before it was grown, they rushed the crop to market as fast as it was picked, in order to satisfy the demands of creditors. Today, ten-cent cotton introduces new conditions, and the planters can avoid this ruinous policy of flooding the markets of the world with cotton, and depressing prices when the crop was owned in the South.

The Chronicle reports world's visible stock November 30, as 3,383,150 bales, compared with 4,072,205 bales on same date in 1899, 4,919,405 bales in 1898, and 4,033,436 bales in 1897.

EXPORTS AND IMPORTS OF RAW COTTON AND WASTE.

Lbs. in units of one million. Value in units of $100,000.

Year Ending June 30.	Exports.									Imports.				
	Sea Island.		Other.		Total.			Cotton Waste.		Raw Cotton.			Cotton Waste.	
	Lbs.	Value	Lbs.	Value.	Lbs.	Value	Value. per lb.	Lbs.	Value.	Lbs.	Value.	Value per lb	Lbs.	Value.
1890	9	23	2462	2486	2471	2509	10.15	..	..	8.6	13.9	16.16	..	..
1891	14	31	2803	2876	2907	2907	10.00	..	..	20.9	28.2	13.49	..	..
1892	19	16	2926	2568	2945	2584	8.77	..	..	28.7	32.1	11.18	..	..
1893	8	17	2204	1870	2212	1887	8.53	..	..	43.4	46.9	10.80	1.9	.8
1894	14	29	2669	2080	2683	2109	7.82	..	..	27.7	30	10.83	2.7	.9
1895	15	28	3502	2021	3517	2049	5.82	..	..	49.3	47	9.53	2.9	1
1896	19	38	2316	1862	2335	1900	8.13	..	..	55.3	66	11.93	6	2.1
1897	21	41	3082	2268	3103	2309	7.12	..	..	51.9	59	11.36	5.3	1.7
1898	16	28	3834	3277	3850	2304	5.98	19.1	7.9	52.7	50	9.48	6.7	1.5
1899	14	24	3759	3072	3773	2096	5.55	21.1	8.3	50.2	50.1	9.98	6	2.1
1900	18	30	3082	2388	3100	2418	7.80	38.6	17.7	67.4	79.6	11.81	7.9	2.4
July	..	..	77.5	76.5	..	..	9.86	3.51	1.70	1.88	2.69	14.31	.39	.14
Aug.	..	..	54.0	52.4	54.0	52.4	9.70	3.60	1.84	1.22	1.53	12.50	.54	.18
Sept.	.1	.2	195.4	201.8	195.5	202.0	10.33	3.76	1.95	2.99	3.82	12.77	.66	.16
Oct.	1.1	2.6	618.2	602.1	619.3	604.7	9.76	8.19	4.48	3.17	4.39	13.85	.42	.13

EXPORTS AND IMPORTS OF MANUFACTURED COTTONS.

Value in units of $100,000.

Year Ending June 30.	Exports — Value.					Imports — Value.							
	Colored.	Uncolored.	Apparel.	Other.	Total.	Colored.	Uncolored.	Apparel	Laces, etc.	Thread.	Knit Goods.	Other.	Total.
1890	29	55	2	14	100	33.7	1.3	3.4	114.5	9	71.5	65.8	299.2
1891	26	93	3	15	137	42.4	1.7	12	105.9	8.6	67.4	59.2	297.2
1892	25	87	4	16	132	45	1.4	12.6	112.5	6.6	58.3	46.7	283.1
1893	28	63	5	22	118	55.4	2.6	16.8	127.4	7.6	63.9	61.8	335.5
1894	38	76	5	24	143	33.8	1	16.6	80.2	3.3	43.6	45	223.5
1895	35	70	5	28	138	54.3	1.2	27.7	116.9	6.6	65.4	59.9	332
1896	34	95	7	32	168	49.2	1.8	26.8	108.8	8.7	61.9	67.1	324.3
1897	48	125	9	29	211	44	2.7	26.3	125.7	6.5	56	83	344.2
1898	41	92	9	25	167	53.1	1.2	10.5	117.7	6.9	40.3	42.9	272.6
1899	52	138	13	30	233	66.5	1.1	10.3	145.5	8.5	43.4	45.3	320.6
1900	48	132	16	37	233	81.6	3.6	12.4	192.1	21	47.2	55.3	413.2
July	4.58	10.28	1.06	2.66	18.58	3.55	.07	.91	14.42	2.32	4.17	6.59	32.05
Aug.	4.15	3.12	1.31	2.55	11.13	2.72	.07	1.52	13.70	1.77	4.65	6.17	32.60
Sept.	5.42	3.61	1.27	2.42	12.72	2.90	.12	1.57	14.88	1.32	4.28	4.75	29.82
Oct.	4.62	3.21	1.32	2.97	12.12	2.80	.17	1.29	19.19	1.46	3.41	4.24	32.56

Pan-American Exposition.

The Pan-American Exposition to be held at Buffalo next year, was conceived with the idea of bringing the 160,000,000 people inhabiting North and South America and our island possessions into closer social and business relations with each other.

The scale upon which the Exposition is being carried out is in keeping with the object to be attained. The grounds are 350 acres in extent, including 133 acres of Delaware Park. There will be buildings for manufactures and liberal arts, graphic arts, horticultural and mining, machinery, transportation, electricity, agriculture, ethnology, art and music, live stock, forestry, ordnance, a model dairy, United States Government group of three large buildings, besides state and foreign buildings.

There will be 33 acres of open courts, which, it is expected, will surpass in beauty the courts of any other Exposition because of their far greater area and more elaborate decorative treatment. Fountains will be on every hand, throwing water into the air in all the fantastic ways that human ingenuity can invent.

Beautiful lawns and gardens will surround the buildings, which have been designed to excel the architectural effect of any previous exposition. These buildings will be covered with staff, moulded into beautiful forms. The best sculptors of America have designed groups of statuary to ornament both the grounds and buildings.

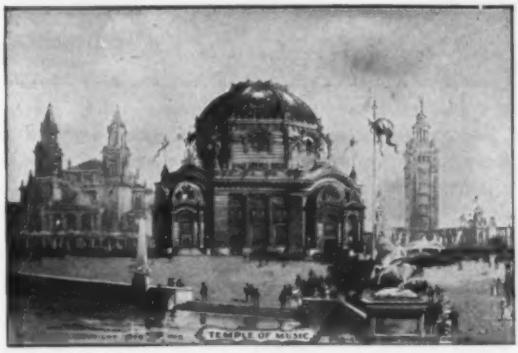
The whiteness of the Chicago buildings added much to their beauty, but the buildings of the Buffalo Exposition are to be colored with harmonious tints that are expected to produce most beautiful effects. Much of this work is complete and in them these anticipations are fully realized. At night, the scene will be illuminated by over one-fifth of a million of electric lights. The "Midway" amusement features will occupy more than a mile

of frontage and promise to be very unique. The grounds are within half an hour's ride of Niagara Falls, which will supply 5000 electric horse-power for the Exposition.

Everything has been done to attract the multitude; but this is simply a means to attain the main object of making the one hundred and sixty millions of people inhabiting Pan-America and the island possessions of the United States better acquainted with one another. Situated on the same continent, with a narrow isthmus between them, through which a water way is soon to be cut, the nations of Pan-America represented at this Exposition are near neighbors, and yet, in many respects, the countries of South America are more foreign to us than are those of Europe.

The countries of North and South America, other than the United States, imported in 1898, goods valued at $548,000,000, and in the same year, the same countries exported goods valued at $688,000,000, making a total value of both exports and imports of one billion, two hundred and thirty-six millions of dollars.

Exclusive of those countries (such as Canada and the Guianas), which are subject to some European power, and whose foreign commerce is to a greater or less extent in the control of the governing power, we find that there are on the Western Continent, outside of the United States, over 60,000,000 people living under independent governments and controlling their own commercial policies. These countries purchased in 1899 goods (mostly manufactured), valued at $370,098,634, of which the United States furnished but $61,171,968 worth. This shows that an immense market for our industries lies undeveloped on this hemisphere. It must be borne in mind that these countries are to a great extent unsettled.



The area of the territory inhabited by these sixty millions of people, is over 8,300,000 square miles. The United States is far from being thickly

settled, but at the present United States rate of population per square mile, this territory would have a population of over 208,000,000. This is a very conservative forecast, for this rich domain will support four or five

times that number of people, and in this estimate no account has been taken of British America and the other portions of the continent still remaining under foreign rule. The possibilities of the future development of North and South America stagger

the imagination. The trade of these countries will increase rapidly with the growth of their population and the development of their great natural resources.

These countries will all be represented at this Exposition. Representatives from them will visit the Fair, both to show the resources of their lands, and to see ours. It is for these reasons that we should be well represented next year at Buffalo. This is particularly true of the textile trades. Central and South America are large producers of raw material for textiles, and consume large quantities of the finished goods, of which they manufacture a very small fraction.

It is unlikely that exhibiting goods at the Pan-American Exhibition will alone be sufficient to build up an export trade, but it will help materially to do it. It is an opportunity for our cotton, woolen, silk and knit goods manufacturers to show these people, who are buying largely from Europe, that they can obtain the same, or better goods, right here, nearer home.

From advices recently received, we judge that our manufacturers have not yet awakened to the full importance of this opportunity of promoting our export business in these great markets of the world.

The Exposition will open on the first of next May, and continue six months. We understand that there has been a very great demand for space at the Exposition, and that if the buildings had been twice their present extent, they could easily have been filled. The allotment of space

has already begun, and manufacturers desiring to exhibit their goods at Buffalo should make application at once. We urge the textile trade to give prompt and vigorous attention to this matter.

Meeting of Woolen and Worsted Overseers.

The eighteenth annual convention of the National Association of Woolen and Worsted Overseers, was held at the United States Hotel, Boston, Mass., Wednesday, Nov. 21, a large number of delegates being in attendance.

The meeting was called to order by its president, Thos. F. Brennan of Walnut Hill, Mass., at 10.30 a. m.

The forenoon session of the convention was largely devoted to routine business. The minutes of the previous meeting were read and approved. The reports of the secretary and treasurer were read and approved. The treasurer's report showed the Association to be in a flourishing condition financially, with a balance of $228.99 in the hands of the treasurer.

Action upon application for membership resulted in admission to full membership of the following overseers: W. A. Wilcox, carder, Madison, Me.; John Sheehan, weaver, Kenyon, R. I.; Robert B. Robinson, carder, South Windham, Me.; William Meyers, carder, Woodbury, Conn.; H. W. Fitzroy, finisher, Rochdale, Mass.; Charles H. Philbrick, carder, Bloomfield, N. J.; Andrew Van Downell, carder, Hillsboro Bridge, N. H.; Charles L. Sweeney, weaver, Enfield, N. H.; John H. Hutchinson, carder, Concord, N. H.; Peter Ramville, finisher, Uxbridge, Mass.; P. S. McBride, master mechanic, Lowell, Mass.; Joseph T. Dolan, finisher, East Madison, Me.; Theodore M. Parent, carder, Rochdale, Mass.; Louis H. Eddy, chemist, Westerly, R. I.; Walter Neeburn, designer, Hampden, Mass.; Henry Viten, carder, Hampden, Mass.; Alfred Clegg, carder, Philadelphia, Pa. The name of Rudolph E. Anderson, East Rochester, N. H., was proposed and he was accepted as an honorary member.

The amendment to the by-laws relative to honorary membership submitted by Fred Dixon of Providence, at the last semi-annual meeting was laid on the table indefinitely, as also was the amendment relative to the Beneficiary feature of the Association proposed by S. Walker of Uxbridge, at the last May meeting.

Election of officers resulted as follows: For the ensuing year. Thomas F. Brennan, Walnut Hill, Mass., was reelected president; Charles Hurst, Providence, was elected first vice-president; M. C. O'Brien, East Rochester, N. H., second vice-president; S. Walker, Uxbridge, third vice-president; John Mulrooney, Enfield, N. H., was reelected secretary; A. E. Jones, Uxbridge, Mass., reelected treasurer; George W. Burr, Lowell, reelected secretary of the Beneficiary Department; Alfred E. Jones, Putnam, Conn.; Frank T. Kennedy, Millbury, Mass., and John Thornton, Wood River, R. I., were elected trustees. The secretary read a paper on carding, prepared by M. H. Halloran, North Oxford, Mass.

Letters were received from M. A. Furbush, Philadelphia, Sydney Harwood, Boston, and M. H. Halloran, North Oxford, Mass., expressing regret at inability to be in attendance at the convention, were read and placed on file.

It was voted to issue the Official Manual free to members. The convention then adjourned, after a most interesting and profitable session.

We show on another page a group of the members in attendance at the meeting, taken by the Textile World. Perhaps a word of explanation is necessary in regard to what appears to be the presence of the same man in two different places in this group. They are in fact two separate individuals, the one in the centre being A. E. Jones, the dyer, while the duplicate at his right is his twin brother, A. E. Jones, the carder.

NATIONAL ASSOCIATION OF WOOLEN AND WORSTED OVERSEERS. 18th CONVENTION, NOV. 21st.
Photographed for the Textile World.

NATIONAL ASSOCIATION OF WOOLEN AND WORSTED OVERSEERS. 18th CONVENTION, NOV. 21st.
Photographed for the Textile World.

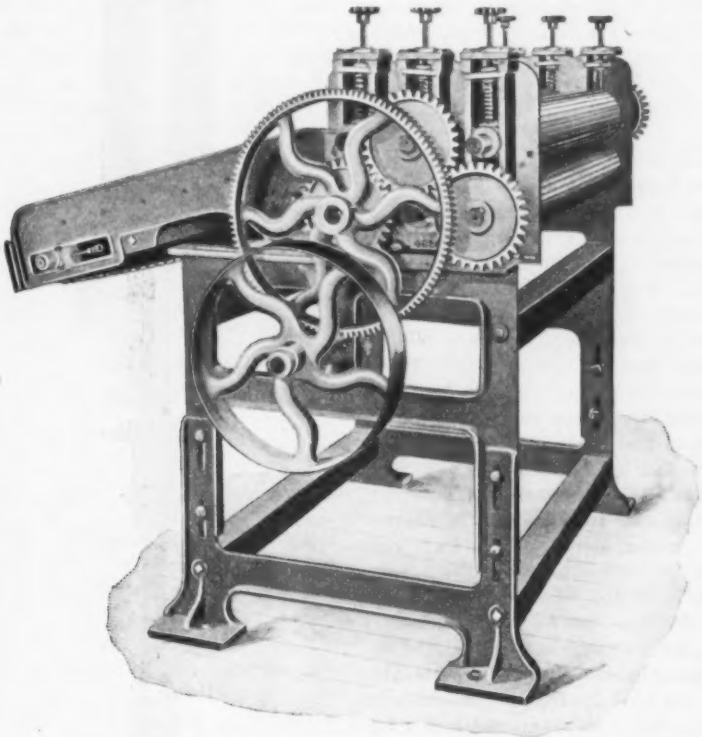
This association has for its sole object the interchange of ideas as to manufacturing processes for the mutual improvement of its members. It is not in any sense a labor organization. During the eighteen years of its existence, its members have steadily kept this purpose of the association in view. Its annual meetings are always well attended, and it should be encouraged as a means of education of overseers in the latest developments of the textile industry.

Crush Roll Machine.

In carbonizing raw stock, the wool or other material is usually delivered by the dryer to a self feed attached to the duster.

The ordinary carbonizing duster has crush rolls on the feed apron.

It is readily apparent that in treating carbonized wool, that is, in running it through sets of rolls to crush the previously carbonized vegetable matter, the thinner the layer of wool, the more exposed is the burr, consequently the better crushing.



C. G. SARGENT'S SONS' CRUSH ROLL MACHINE.

The principle of the continuous cone duster is such as to require a narrow feed, and consequently the crush rolls must be narrow, if attached to the duster. This necessitates a thick layer of stock passing through the crush rolls, which are under these conditions unable to crush the carbonized burr into a powder that can be carried off by the dusting process.

—When removing spots, lay the cloth on a piece of blotting paper, and drop the benzine or other liquid on the spot to be removed, at the same time striking the spot with a soft cloth pad. The oil or grease will be dissolved and absorbed by the blotting paper and the pad. Another method consists in making a paste of magnesia and benzine, and applying it to the spot until the benzine has evaporated, or the spot has disappeared.

It is desirable that the wool coming from the dryer should be treated immediately while hot, and fed very even into the crush rolls.

In order to pass the stock through crush rolls in a thin layer, as soon as it comes from the dryer, and while still hot, the crush roll machine shown in the illustration has recently been built by C. G. Sargent's Sons, Graniteville, Mass.

This machine is customarily attached automatically to the carbonizing dryer, in which case the dryer delivers into an automatic feed, which in its turn passes the wool to the crush roll machine. The crush roll machine delivers the stock to another automatic connection, which in turn delivers to the carbonizing duster.

It is built in two widths, 36-inch and 48-inch, and is equipped with three, four, or five sets of fluted crush rolls, according to the desire of the purchaser. The machine is all iron and the rolls are made very heavy, 5½ inches in diameter. They are geared together, and the pressure is regulated by means of springs and hand wheels. The machine is fitted with a feed apron so that it can be fed by hand or can be fed by an automatic feed.

It will be noted from the cut that the frame of this machine is adjustable, giving an adjustment up and down of three inches either way. With three sets of rolls the machine occupies in length five feet; with five sets of rolls it occupies six feet, the dimensions including the over-all length over the feed apron. The machine is simple and compact and drives with one belt.

—The government has decided not to make an appeal from the decision of the Board of Appraisers as to the duty to be levied on gloria cloth. This decision provides that the duty on these goods shall be 8 cents per square yard and 30 per cent. ad valorem, instead of 50 cents per lb., as claimed by the government. The goods vary in weight from 1⅓ to 8 ozs. per square yard.

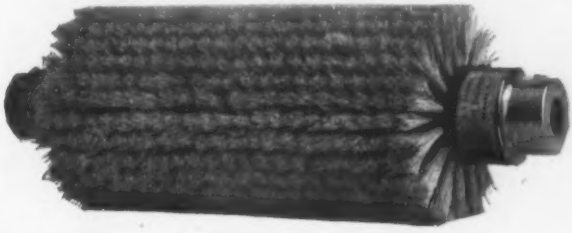
Spindles for Cap Spinning Frames.

The illustration shows a cap spindle manufactured by Ward & Vandergrift, Elmer, N. J. For medium and fine counts, this system of worsted spinning has proved its superiority.

Like all other mechanical devices, good workmanship must supplement the correct principles. The spindle must be of good material, of such proportions that its weight will be in pro-

portion to the length, insuring stability while machine is in motion.

Ward & Vandergrift have made a special study of spindles for cotton, woolen, worsted and silk, and their knowledge of what is required for different kinds of work, combined with their excellent shop equipment, enables them to give the best service in this line to textile manufacturers. They manufacture hammered brass tubes, which are noted for their durability and ease of operation. The high quality of these tubes is shown by the small quantity of oil required. This firm have an iron and brass foundry in connection with their machine shop, and are well equipped in every respect to supply the trade promptly and economically.



JACOBUS FIBRE COMBER BRUSH

A New Patent Fibre Comber Brush.

The accompanying illustration shows a cylinder comber brush, manufactured by Austin G. Jacobus, Verona, N. J. It has been found that nothing but the best bristles can be used in bristle brushes for combers. An inferior grade causes much waste and loss of production. The better grade of bristles is very expensive, and in order to avoid their use, the Clark Mile-End Thread Company, of Newark, N. J., some time ago tried an experiment with the Jacobus patent fibre brush. The results were so satisfactory that they have used nothing else for brushes on their combers since then.

The fibre proved equal to the best bristles. The price was much less, and the brush did the work as well. Since then, they have been used in many other mills with equally good results. Mr. Jacobus manufactures a full line of all kinds of brushes required for mill use. They have a large number of workmen employed, and sell their goods direct to the consumer. The business was established in 1835, by L. W. Jacobus, father of the present proprietor, and for sixty-five years they have been engaged in the manufacture of brushes, and, consequently, are well equipped by experience to give the best satisfaction.

—In some of the large worsted mills in England, the noils, as they come from the comb, are carried by a blast of air through pipes to the storage bins which can be located in any convenient part of the mill.

—The high price of cotton is stimulating its cultivation in Brazil. In Sao Paulo cotton is being planted on a large scale by the Piracicaba cotton factories, which expect within a comparatively short time to be able to supply all the sacking necessary for the moving of the coffee crop. Overseers from the United States have been introduced on the cotton plantations.

At Itu large plantations of cotton have also been inaugurated, which are said to be very promising.

—It is reported that cotton fabrics have fallen into disfavor among the Scotch working girls, and that wool cloths have taken their place.

Sky Lights.

While the advantages of roof windows for lighting our mills are well known, their use has been restricted, owing to the trouble and annoyance

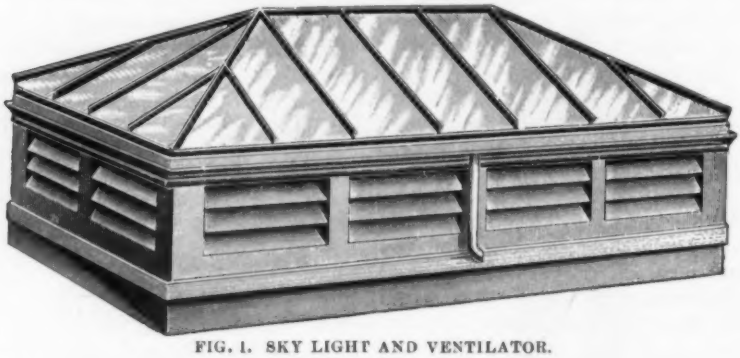


FIG. 1. SKY LIGHT AND VENTILATOR.

which they caused by leakage or breaking down from weight of snow and ice. Another objection was the difficulty of shading them properly, in order to protect the room from the flood of light which an opening in the roof will admit.

The first two objections are overcome by improved construction, and third by the use of ribbed glass to dif-

HIPPED TURRET SKYLIGHT.

fuse the light throughout the room. We illustrate at Fig. 1, a Hip Skylight and Louvre ventilator, made by The G. Drouve Company, Bridgeport, Conn. This skylight is constructed with special care to combine strength and light weight. The metal is so distributed as to remove the danger of breakage from expansion and contraction. The glass is fastened with putty and metallic caps, and gutters are provided for carrying off the water of condensation.

Fig. 2 illustrates a Hipped Turrett Skylight, with swing sash for ventilation, and is particularly well adapted for mills, stores and workshops.

Fig. 3 shows a Drouve ventilator which is so constructed as to combine ease of exit for the air and protection against the ingress of rain, snow or down drafts.

In addition to these, this company make a large number of other styles shown in their illustrated catalogue and can supply skylights for places requiring special construction. The old fashioned wood construction has been tried and found wanting, while the metal frames and ribbed glass have been subjected to the test of experience and have given satisfaction.

If kept painted, they will last indefinitely. Besides skylights, the G. Drouve Company furnish ventilators

DROUVE VENTILATOR.

for saw-tooth roofs, dyehouses, etc., in addition to a full line of finials, crestings, conductor pipes, and architectural sheet metal work.

A New Fire Nozzle.

The "F. and F." Nozzle Co., Newburgh, N. Y., are placing a new spray and direct stream nozzle on the market that is very highly spoken of. It is intended for use in fire departments, shops, factories, mills, hotels, etc.

As fire protection is a matter of great importance to textile mill owners, we call their attention to this nozzle. It protects the man behind the nozzle, allowing him to hold his behind it the man stands directing the stream upon the fire at close quarters.

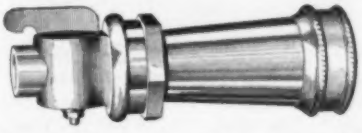
The direct stream can be shut off, and the whole volume of water thrown as a dense spray, very wide and heavy for driving smoke, light fires, sprinkling, etc.

Should it be desired to move the hose from one place to another, the water can be entirely shut off at the nozzle and the change made, thereby saving damage by water and very valuable time.

F. & F. FIRE NOZZLE.

ground, no matter how dense the smoke or intense the heat may be.

In ordinary use it acts the same as any other nozzle, but when required can, by the turning of a hand screw, cause a sheet of water to be between



him and the fire. This spray being solid, smoke, heat, gases, light cinders, etc., cannot pass through it and

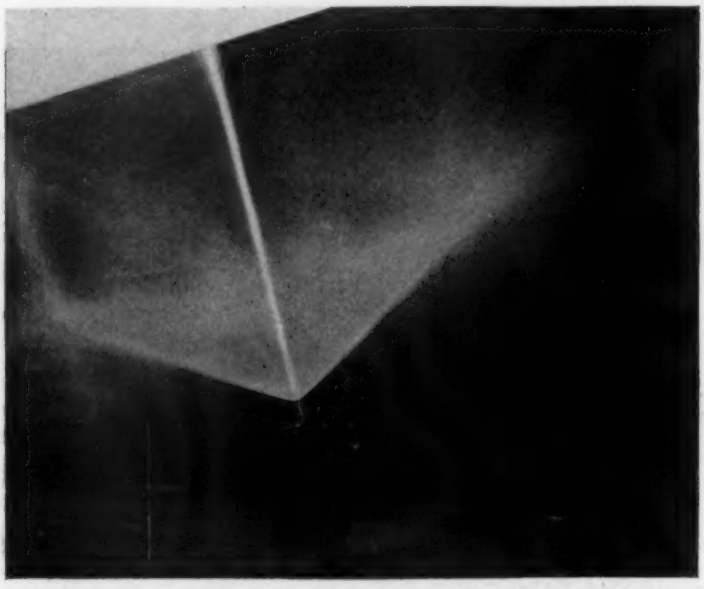
All these changes can be instantly made. The cuts (from photos) give an idea of its workings, showing direct stream and spray together and stream shut off with whole force in spray.

The nozzle is now in use in 20 or more fire departments and a large number of mills, and has met with strong approval. The company have a large number of unsolicited testimonials.

This nozzle will form a valuable addition to fire departments in our textile mills, and will be sent on 30 days trial.

General W. F. Draper.

His Majesty Victor Emmanuel III., the present King of Italy, has conferred upon Gen. W. F. Draper, the grand cordon of the Order of St. Maurice and St. Lazarus as a mark of the esteem in which Gen. Draper, until recently the U. S. minister to Italy, is held by the King and his court. This order is one of the oldest in Italy, the order of St. Lazarus having been founded in 1434. Until within a comparatively short time the cordon of this order was confined to noble families of Italy. It is one of the highest honors that the King of Italy can now confer upon a foreigner.



F. & F. FIRE NOZZLE.

Notes of the Month.

—An English invention for covering drawing rolls of spinning machinery has been recently patented in this country. The patent specifications state that a seamless tube, made of a mixture of nitrocellulose with nitroricinolein is employed. The mixture consists of one part of the first and two parts of the last named ingredient.

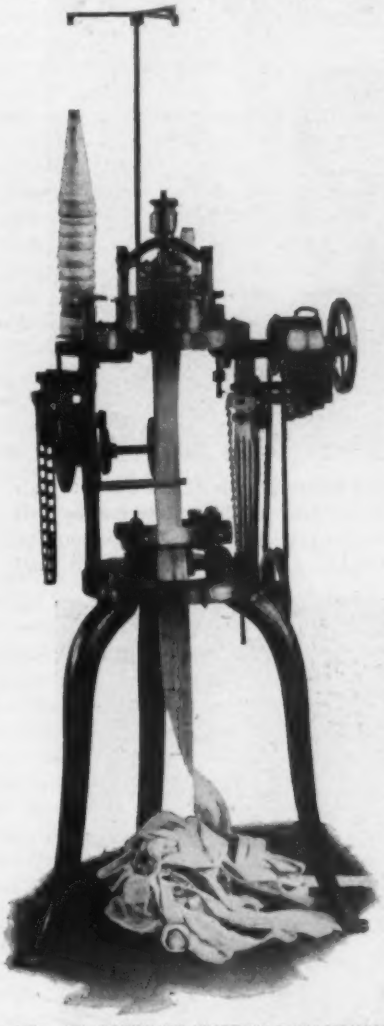
—Manufacturers who want 1¼″ to 1⅝″ staple cotton will have to pay for it. The demand for this grade has been largely increased of late, as many spinners who have been buying Egyptian cotton in the past are using American staple of this grade, on account of the high price of Egyptian, and then staining it.

—The plans for the new Textile School building at Lowell have been accepted by the trustees. It is intended to have the buildings form a square around an enclosed court. The main building will form the head house. The advantage of this method is that additional stories can be added to the wings, or galleries, to accommodate future growth of the institution.

—During the past sixteen years, seventy-nine cases of explosion of kiers, drying cylinders and other hot fluid vessels, not including steam boilers, have been reported in Great Britain, these involving the loss of forty two lives and injury to 128 persons.

The George W. Lindley Circular Rib Knitting Machine.

This machine which is the result of many years of continuous effort to combine efficiency with simplicity of construction, is shown in the illustration. The makers have been quick to respond to the criticism or suggestions of knitters using the machine, and are confident that now the machine is one of the best. They claim that its construction allows the highest speed, giving a large production of perfect goods. Every movement is positive, and the needle breakage is reduced to a minimum. It is easily adjusted for different sizes of yarn, and knits a perfect top. Experience has demonstrated the durability of this machine. It knits plain, or automatically slack course and welt. The manufacturer, George W. Lindley, proprietor of the Germantown Hosiery Machine Works, 5122 Wakefield Street, Germantown, Philadelphia, will be pleased to furnish knitters with full particulars and samples.



GEO. W. LINDLEY KNITTING MACHINE

This establishment makes a general line of knitting machinery, including cardigan jacket machines, cylinders and dials for all kinds of machinery, also the Germantown skein winder and links for double ribs.

In addition to knitting machines, Mr. Lindley is equipped to do general repairing of Platt's cotton spinning machinery.

—A recent visitor in Germany writing of his visit to a German hosiery mill says: The factory, for cleanliness, light, and ventilation, was excellent. The workpeople were clean and well dressed. They have many advantages that augured well for the interest the employer takes in the workers. Lunch and tea rooms are provided, also rooms for recreation, reading and instruction. I noticed a closeness and good feeling between workmen and employer that explains as much as anything why the Germans are beating us. The hours worked were, men eight per day, and the women nine. The machines worked were principally Seyfert and Donner's make, and many were even worked by hand, but a new factory is being built for Cotton's patents. The wages of the men run from $4.20 to $5.60, the women from $2.38 to $4.20, the girls from $1.67 to $2.14 per week. There were some English machines at work, but the German machines seemed about equal. The cost of the English machines, however, was found to be about 40 per cent. above the German.

Block Cutting and Fabric Printing.

The popularity of fancy printed effects in both piece goods and hosiery, makes the manufacture of appliances for doing this work of special interest at the present time. To begin with, artistic talent of a high order is required, and this must be supplemented by mechanical skill of an equally high order.

Block printing of hosiery is now much used to produce the fancy effects which the machinery in American knitting mills is not fitted to knit in the fabric. The extracting, as well as the printing of hosiery, is done by blocks, and upon the design and

workmanship of this block depends the success of the styles.

The illustrations show the workrooms of Smith & Meinken, 427 West 13th St., New York, who have a large establishment equipped for the designing of patterns and manufacture of rolls and blocks for textile printing. They have eighteen men constantly employed in their sketch department, and 175 names on their pay-roll. A force of men who are experts in their line, having been trained in the best establishments in Manchester, England, are employed in making the copper stamps. This concern manufactures their own rollers and blocks, and the relief work is made in either brass, copper, wood, steel, or type metal. They thus control every stage of the process, and are able to turn out a product of the best quality.

They make a specialty of all kinds of rollers and blocks for fabric printing. Fancy hosiery is now very popular, and Smith & Meinken can supply knitters with printing blocks of any desired pattern at short notice.

Notes of the Month.

The plan formed by the Southern cotton yarn spinners to sell their own goods is now developing into a scheme to provide warehouse and banking facilities for the mills. Under this plan the goods of each mill will be sold under the mill's own name. The promoters claim that with the present system the selling agents purposely encourage the false idea that Southern yarns are of inferior quality. They also claim that the new method will reduce cost of storage, transportation, interest and various other charges.

The Southern Cotton Spinners' Association have sent a committee to Philadelphia, to hold a conference with the committee representing the commission merchants, on the general subject of selling cotton yarn, and also to continue the investigation inaugurated by the manufacturers some time ago, as to the causes for the recent sudden and sharp break in prices of yarn.

—The following figures given by Mass. Bureau of Statistics show comparative condition of textile trade during 1898 and 1899.

Industries.	Number of Establishments Considered	Amount of Capital Invested. 1898.	Amount of Capital Invested. 1899.	Increase (+) or Decrease (—) in 1899. Amounts.	Increase (+) or Decrease (—) in 1899. Percentages.
Carpetings	12	6,582,652	6,630,869	+48,217	+0.73
Textile	8	6,249,070	6,319,437	+70,367	+1.13
Other	4	333,582	311,432	—22,150	—6.64
Hosiery and knit goods	33	3,884,918	4,116,459	+231,541	+5.96
Cotton goods	158	111,805,784	126,159,262	+14,353,468	+12.84
Cotton goods (woven)	115	94,287,523	99,757,670	+5,470,147	+5.80
Cotton yarn and thread	35	16,808,660	25,607,210	+8,798,550	+52.16
Cotton waste	8	649,611	734,382	+84,771	+13.05
Woolen goods	188	26,227,676	28,416,883	+2,189,207	+8.35
Woven goods and yarn	119	25,477,359	27,634,968	+2,157,609	+8.47
Shoddy, waste, etc.	19	750,317	781,925	+31,598	+4.21
Worsted goods	34	17,542,193	18,372,545	+830,352	+4.73

—It is a conservative estimate that the cotton boll weevil destroyed 100,000 bales of cotton in Texas during the past season.

—The statistics of the operation of 19 Maine mills in 1897 and 1899, are given in the following table, and by comparing the two years, the extent of last year's boom can be seen:

	1899.	1900.	¢ Increase.
Capital invested	$2,077,800	$2,436,305	17.2
Cost of material used,	1,968,227	2,337,297	16.9
Wages paid	722,555	873,344	20.8
Value of product	3,158,805	3,943,800	24.8
Average weekly wages of men	8 60	9.09	5.7
Average weekly wages of women	6.08	6.32	4.0
Average weekly wages of children	3.72	4.05	8.8
Average number of men employed	1,337	1,440	7.7
Average number of women employed	600	616	2.7

—The Board of Classification has decided the fancy cotton importation case, on which appeal was made from the collector's decision that the goods contained threads other than the ordinary warp and filling, and should pay the higher rate. The Board upholds the collector in all cases except as to one sample, and decides that the importers must pay the additional duty of two cents per square yard.

—A petition has been presented to the Secretary of State by forty-five Southern cotton manufacturers, asking that steps be taken to preserve the "open door" in Manchuria. The bulk of the goods exported to China by the petitioners, goes to Manchuria, and fears are entertained that the growing Russian influence in that portion of China, will result in the exclusion of all except Russian goods.

—There were exported in October of this year from the United States, 81,493 round bales of cotton. Estimating 250 lbs. per bale, this makes 2,037,325 lbs. in the round form out of a total of 618,287,501 lbs. exported in that month, or about one pound out of thirty.

—Owing to the Boxer troubles, our exports of cotton cloths to China in October were 390,000 yards, valued at $25,375, compared with 15,029,453 yards, valued at $772,834 in same month of 1899. For the last four months, our total exports of manufactured cottons were valued at $5,455,000 or at the rate of $16,365,000 per year, compared with $23,365,000 for previous twelve months.

—The table of exports and imports of raw cotton in this issue of the Textile World, shows the large exports of raw cotton for October, amounting in value to $60,400,000, the price per pound averaging 9 76/100 cents. This is an advance of 75 per cent. over the price per pound for the year 1899, which was 5 55/100 cents. The value of the cotton exports for the twelve months ending June 30, 1899, was less than 3½ times the value for the one month of October, 1900. Another fact worth noting, is the heavy exports of cotton waste, amounting to 8,190,000 pounds in October, compared with 3,760,000 pounds in previous month, and 39,000,000 pounds in the twelve months of 1899.

Foreign Notes.

—The winter clothing of the German troops in China is to be of a shade called "Feldgrau" (field grey). It is a mixture of white and bright olive, and is said to be more attractive than Khaki, while concealing the position of the troops in the field fully as well as the last named color.

—In Germany about five times as much artificial dyestuffs are made as in all other countries combined. According to the last census, on the 14th of June, 1895, there existed twenty-five factories for the manufacture of aniline and aniline colors, and forty-eight factories (with seven branches) for the production of other coal-tar products (i. e., not only for colors, but also for other commodities, such as picric acid, etc.) The aniline works employ 7266 hands, the latter factories 4194; in all 11,460 men.

—The practical operation of Canada's preferential tariff, is shown by the following table giving the increase of imports into Canada from the United Kingdom for the year ending June 30th, 1900, as compared with the year 1898:

Articles.	Increase.	Per cent.
Woolen tissues . . .	$708,255	64.1
Cotton yarn	407,379	35.7
Carpets	386,838	51.9
Cotton piece goods, printed,	181,526	22.5
Linen piece goods . .	256,225	40.3
Cotton piece g'ds, bleach'd,	256,118	140.4
Silk, manufactures of .	182,978	161.8

—A process for sizing cotton yarn has been patented in England. The principal feature is the drying of the yarn before the size is applied. It is claimed that by first expelling the moisture, the thread absorbs the size more easily, and much better results are obtained.

COTTON DEPARTMENT.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

An Improvement in Ring Spinning.

The high speed at which spindles for the ring spinning and twisting have been operated during recent years, has subjected the traveler to great friction and wear. This has limited the speed, and, consequently, the production, of ring spinning and twisting frames.

Everyone familiar with ring frames, knows that when the frame is started and the spindle begins to move, the strain on the thread draws the traveler tightly against the ring. This is especially the case if the thread is being wound on a small diameter. If the diameter is large, this strain or the traveler against the ring is somewhat relieved, as the larger circumference on which the thread is being wound brings the strain from the traveler more in line with the circumference of the ring, while if the thread is being wound on a small diameter, the strain comes more in a direction at right angles with the circumference of the ring. It is owing to this fact that the threads often break down when a frame is started.

After the spindle and traveler have attained a high speed, this strain on the yarn is relieved somewhat by the centrifugal force caused by the rapid revolution of the traveler. This force throws the inner hook of the traveler upward against the inner flange on the ring, while the outer hook of the traveler is slightly depressed. This position of the ring while in operation has been taken advantage of in an invention recently patented by George O. Draper, in which he seeks to avoid excessive wear of the traveler and the

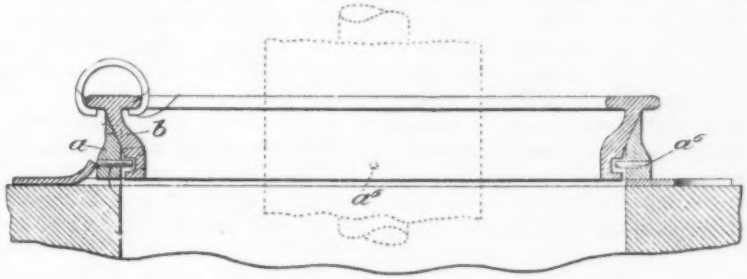


Fig 1

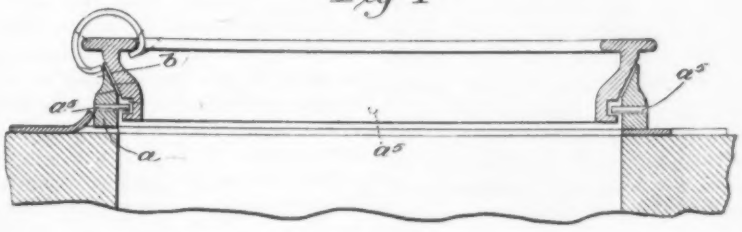


Fig 2.

ring on high speed frames, by using two rings, the inner one (b) being movable, while the outer portion (a) is fastened to the ring rail. Figure 1 represents the traveler in the position which it assumes when frame is standing. The inner movable portion of the ring (b) is provided with outer and inner flanges at the upper side, while it is supported, or held in position, by the pins (a5), which are fastened in the fixed, or outer portion, of the ring, and project into a groove in the circumference of the inner or movable ring.

Figure 2 represents the position which the traveler takes when the frame is in operation. The centrifugal force has raised the inner part of the traveler, and depressed the outer part, so that the latter touches the fixed portion of the ring. It is in this position when it attains full speed, and the friction between the inner flanges of the ring and the traveler, causes this movable ring to revolve with the traveler, and it gradually reaches the same speed, so that the traveler and movable ring revolve together, and there is no friction caused by the traveler rubbing against the 'nner flange of the ring.

The outer part of the ring, however, is stationary, and as the outer end of the traveler touches it, there is a friction caused at this point, which gives the drag on the yarn necessary for properly winding it on the bobbin. As the movable part of the ring revolves, the centrifugal force causes it to rise until there is a space between the movable and fixed parts of the ring, thus preventing friction between them. The pins, or studs (a5) are so adjusted as to hold the ring in proper position.

Practical Notes on Cotton Spinning.

WM. SCOTT TAGGART.

(Concluded.)

We will now proceed to trace the gearing of two motions that are very closely related to each other, viz., the bobbin driving and the lifting motion for the bobbin rail.

A glance at Fig. 22 will show a mass of gearing at the lower part of the frame, all of which is used for working the two motions mentioned above. Further examination will, moreover, show that both motions are dominated by the cone drum belt, and as we know this to be a variable speed factor, we conclude that the bobbin speed and the rack speed are always changing.

To make this clear, two drawings are given showing the "bobbin driving" and the "lifting rack driving" separate. In Fig. 25, starting from the driving shaft, we have the following wheels working to drive the bobbins. In the first place B drives the top cone through the 52s carrier and the wheel V, the top cone drives the bottom cone; F on the bottom cone drives the Sun wheel J through the 64s carrier, R and E.

In the second place it must be observed that H and J are wheels forming part of the differential motion, and H is driven directly through the differential motion at a high speed from the driving shaft. In addition to this direct motion, it receives an additional motion from the motion transferred through J and the differential motion; we thus see that the speed of H is a combination of two speeds, the highest of which it receives direct from the driving shaft and the slowest from the cone drums.

This fact ought to be thoroughly understood, because many people seem to think the bobbins are driven through the cone drums, instead of which the bobbins only receive a very small proportion of their speed from this source; as a matter of fact, the bobbins are driven at a slightly quicker rate than the spindles, and it is only the excess speed of the bobbin over the spindle that is transferred through the cone drums. On the face of it, one would thus conclude that the cone drum belt had very little to do, but an examination of the Houldsworth sun and planet motion, will

show that the wheel H runs in the opposite direction to the driving shaft, on which it is revolved; serious opposition to movement was caused, and as the cone drums had to effect a reduction in the speed of H so as to reduce the speed of the bobbins, a great resistance had to be offered to H, and strap having to offer a resistance to its movement, it is assisted, and consequently very little strain comes on the belt, and the liability to poor rovings is reduced to nil from this cause.

H, it will be observed, drives the spindle skew bevel N through the carrier wheels 65 and 32. A word ought

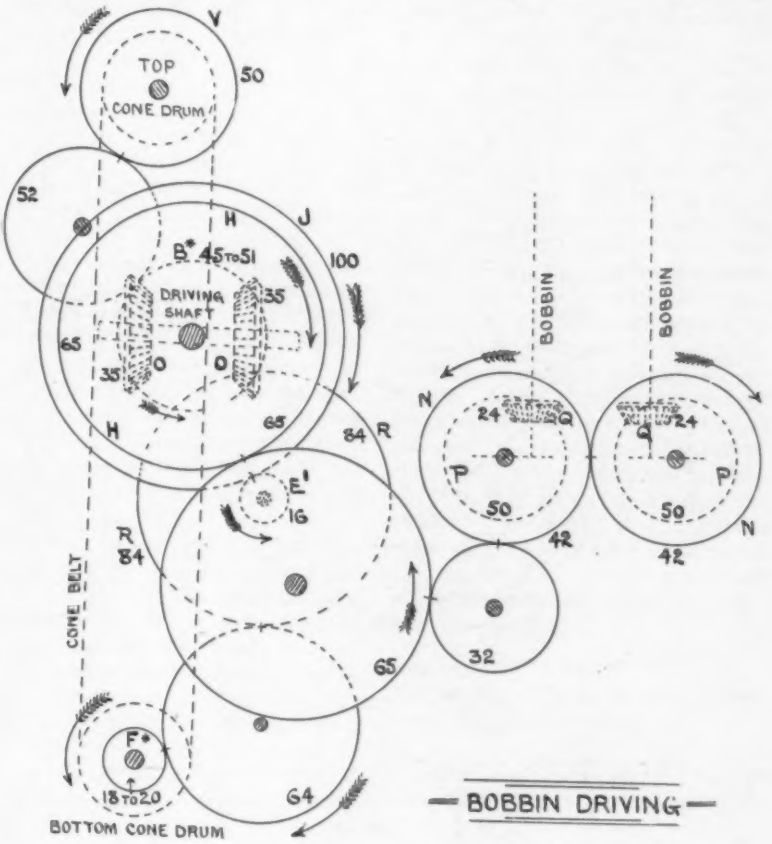


FIG. 25.

of course it all fell upon the strap, causing, it need hardly be said, a severe strain, which resulted in slippage and breakage and ultimately irregular and spoiled rovings.

With all new differential motions, the wheel corresponding to H, now runs in the same direction as the shaft, so that instead of the cone

to be said in regard to the spindle skew bevels N and the spindle wheel Q; these two wheels must be well geared, otherwise these work with a terrific noise and jump constantly. In addition, it will be noticed from the drawing, that there is a tendency in N to lift the wheel Q together with the bobbin which rests on it. This accounts

for a lot of bad looking bobbins and spoiled rovings. In new frames it will be found that efforts have been made so that the tendency is the other way, thus reducing the noise and preventing the jumping and rattling which is so disagreeable a feature of some frames.

Since the top rail carrying the wheels N and P rises and falls for the building of the bobbin, the two wheels 65 and 32 are carried by swinging brackets so that they may accommodate themselves to the new positions occupied by the rail. This accommodating movement naturally results in causing N to gain and lose slightly in its up and down motion, because of the epicyclic character of the movement; but in many frames now built, even this small error is eliminated by so guiding the wheels 65 and 32 by special carrying brackets, that the rolling movement is neutralized.

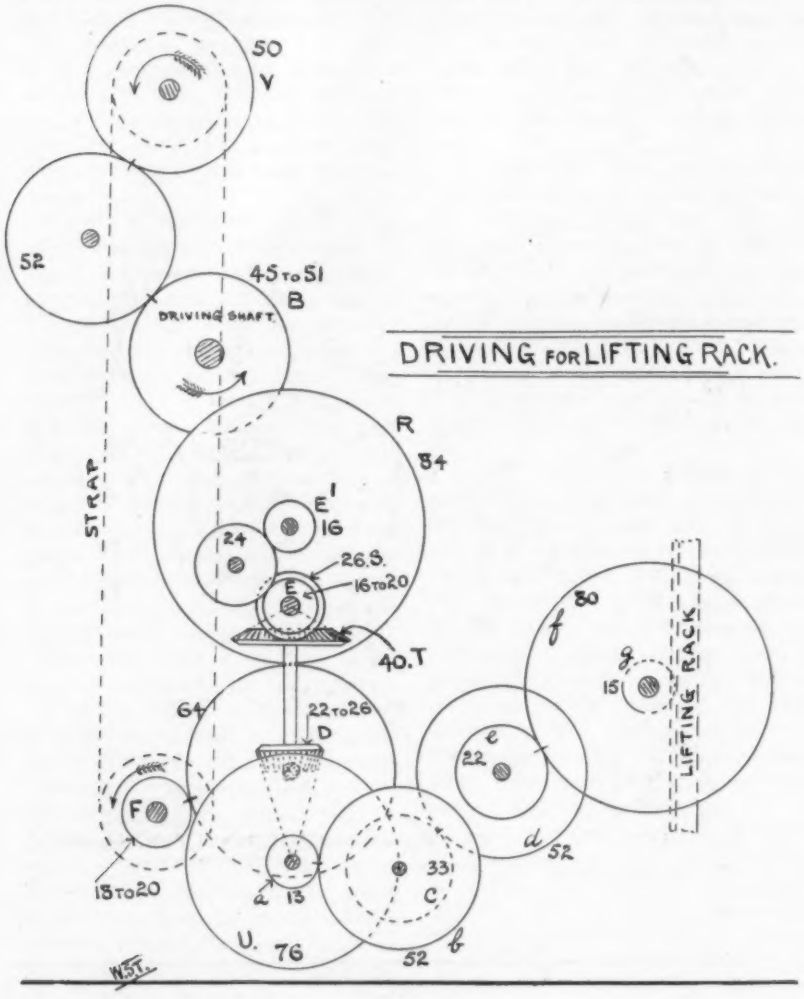


FIG. 26.

Fig. 26 illustrates the method of driving the rack attached to the top or bobbin rail. It is driven direct from the driving shaft as follows,

leaving out the single carriers, as they are used simply to change the direction of the motion and not to increase or diminish it.

B drives V; top cone drives bottom cone; F drives R; E^1 drives E; S drives T; D drives U; a drives b; c drives d; e drives f; g drives the rack.

For calculation purposes the above would be written so: (Speed of B × B × dia. of top cone × F × E^1 × S × D × a × c × e × g) ÷ (V × dia. of bottom cone × R × E × T × U × b × d × f) = rvs. of g. When the speed of "g" is known, it is a simple matter to find the rate at which the rack lifts. The drawing will clearly illustrate that the lifting of the rack will vary exactly in the same proportion as the excess speed of the bobbin varies as it fills.

It has already been pointed out and emphasized that the bobbins only derive their excess speed over the spindles, from the cone drums, so that it is easily understood that the variation in the speed of the lifting rack will only vary as the excess speed of the bobbin varies.

Too much stress cannot be laid upon this point. The failure to understand it causes innumerable students and workers in the mill to derive most erroneous ideas on the subject.

Suppose, as an illustration, that ¼ inch roving is put on the bobbin during one revolution of the spindle, on a 1¼ inch bare bobbin, one round of roving would be put on in about 16 revolutions of the spindle, and in this time the rack would have lifted a distance equal to one dia. of the roving. Now when the bobbin is built up to 3 inch dia., the quarter of an inch would still be put on during one rev. of the spindle, but one complete round would not be put on until the spindle had made 37¾ revolutions; the rack in this case must only lift a distance equal to the dia. of the roving during the time the spindle makes 37¾ revolutions. In other words, the rate at which the rack moves must vary in inverse proportion to the diameter of the bottom.

This, it will be noted, is the principle upon which the curved surfaces of the cone drums are formed, and therefore the varying in speed of the bottom cone drum, when transferred to the lifting rack, gives to it its proper varying speed. Alterations in the speed of the rack to suit different purposes, may be made by changing B, E or D, or even all combined.

An interesting feature to note, is that the strain of lifting the bobbin rail is thrown on the cone drum strap. If a rail is well balanced and erected, all slides good and every spindle running true without any binding action in the collars between the top and bottom position, then the rail takes little power to move it; but from experience extending over hundreds of dynamometrical tests on all makes of frames, I have found very few but where more power was taken at one portion of the lift than at another. Many cases could be quoted where 40 per cent. more power was taken to drive the machine when the rail was at the bottom than when it was at the top. Extreme friction is of course the cause and is due to the bad setting of the spindles, and the rail guides not being parallel to the collars which support the spindles.

Putting Up of Yarns for Use and for Market.

Abstract of a paper read by F. H. Bishop, Boston, Mass., before the New England Cotton Manufacturers' Association, Washington, D. C.

In comparison with the great improvements made during the past thirty years in methods and machines for the preparation and spinning of cotton fibre, there have been very few marked changes in the systems or machines for winding yarn for transfer in the mills or for shipment and use.

The use of bobbins or spools for transferring yarns in the different processes has been general in the absence of, or for the lack of better systems. The first cost, repairs, and storage space of bobbins are such important factors in

the economy of yarn manufacture, that it has long been recognized that a system of winding yarn in a mass that should be self-sustaining without supporting heads, would be advantageous.

The motive of Coombes, who invented drum winding machines, was to wind upon a central support without heads, and to make the package self-sustaining by imparting to his yarn guide a quick reciprocation, so that the yarn instead of winding in close coils, as on the bobbin, would wind in open coils crossing and re-crossing between the ends of the traverse, thus binding down and holding in place the preceding coils. He succeeded in producing a self-sustaining mass, but this advantage was more than counterbalanced by the defects and inequalities in winding.

FIG. 1.

This system has never superseded bobbins in the mills for transfer work, although it has been used extensively in winding yarn for shipment where the cost of bobbins and of trans-shipment of the same more than compensated for the defects in winding.

In drawing yarn on to a central tube or core by frictional contact with the surface of a revolving drum, the speed relation of the yarn to the tube is constant without regard to the diameter of the package. There is, however, a constant variation from start to finish in the speed rotation of the winding spindle, which starting with a small diameter, is driven rapidly,—this speed decreasing as the mass increases in diameter.

At the beginning of the operation of drum winding, the tube will be rotated at such speed in relation to the speed of the yarn guide, that three to five coils will be laid upon the core for each traverse of the guide, the result being a fairly compact mass in a package of small diameter; but, as the yarn guide speed is constant and the rotation of the winding spindle variable, being constantly reduced in speed as the mass increases in diameter, the result is that the yarn is laid in more open coils, the crossings between the ends of traverse being less frequent and the density of the package constantly decreasing. The change of the angle of the coils also results in an increasing slippage of the yarn at each end of the traverse, which has the effect on soft yarns of adding to the twist at one end of the traverse and reducing the twist at the other.

As the yarn guide is placed some distance from the winding spindle, the sway of the yarn allows the coils to

assume irregular positions, and to frequently override at the ends of traverse, forming loops or cobwebs on the ends of the package.

In his invention of the "Universal" system of winding, S. W. Wardwell departed entirely from all precedents, and proposed to lay the fibre in such unvarying relation that the density of a mass wound by his system should be determined by the specific gravity of the material. This he accomplished by winding yarn around a central core

FIG. 2.

in helical coils, the number of coils between the ends of the traverse being adapted to the diameter of the winding spindle and the length of traverse.

These helical coils turn with an abrupt bend at the end of the traverse and returning, cross the preceding coils, the yarn at each end of the traverse being carried over the preceding coil and laid parallel and in close contact with it during the reverse movement of the guide, the repetition of this process being continued until a complete layer of coils surrounds the central tube, every coil being in perfect alignment, crossing and recrossing between the ends of the traverse, thus tying down and binding with every coil all those which preceded it, and forming a solid, compact foundation built with absolute uniformity.

As very little tension is required in winding by this method, the fibre retains its original form and elasticity, and can be drawn from the surface of the mass for delivery to its ultimate use without tangling or kinking.

In the construction of machines for putting into practice the Universal system of winding, Wardwell adopted positive, instead of inductive conditions for the control of the yarn. In Universal winding machines the speed relation of the winding spindle and yarn guide is constant, thus insuring an exact number of coils in each layer of the winding from start to finish. By the interposition of adjustable mechanism—such as an expansion pulley—between the winding spindle and the yarn guide actuating parts, the spindle has imparted to it a slight acceleration of movement, so that when the guide reaches its extreme position at the end of the traverse, the spindle will have rotated slightly beyond the position it occupied at the time of the previous reversal of the guide movement.

In practice this mechanism is adjusted to impart a gain to the winding spindle equal to the diameter of the yarn being wound, thus causing the yarn to be carried over and across the previously laid coil, and to lie parallel to and in close contact with the preceding coil during the reverse movement of the guide. By a proper adjustment of this "gainer" mechanism, the finest yarn and coarsest cord alike can be wound with equal precision on the same machine.

The winding spindles are driven positively, causing a gradual increase of the delivery speed of the yarn to the spindle as the cop or cone increases in diameter.

One of the most, if not the most important point to be considered in yarn winding, is that of properly applying tension during the process to avoid abrasion of the yarn and the impairing of its elasticity by uneven or excessive strain. All forms of tension devices which interpose a fixed condition between the winding guide and the yarn supply are defective in principle and operation.

The most common form of positive

frictional tension in use is a felt or cloth pad over which the yarn is drawn to the winding spindle. Any resistance to the free delivery of the yarn from the supply, such as would be caused by over-riding of coils in a badly wound cop or bobbin, is magnified many times at the tension pad, resulting in undue stress and frequent breakages of the yarn.

The rough pad abrades the surface of the yarn and disturbs the twist, especially on soft yarn, where it pushes back the twist, causing it to accumulate at varying intervals, making the yarn uneven and creating alternate hard and soft places. It also collects lint and dirt, which is caught up on the yarn, forming loose slubs or bunches. Machines supplied with this tension are commonly used for a wide range of yarn, all subjected to the same amount of frictional contact with the pad, without reference to the size or twist of the yarn.

The Universal tension consists of a series of interlocking steel fingers with polished oval surfaces, between which the yarn is drawn on its way to the guides. These fingers press alternately on the yarn to deflect it from a straight line, and cause it to be delivered with absolute uniformity to the winding spindle. The pressure of the fingers can be adjusted to all sizes and qualities of fibre, from the finest silk to course, heavy twine. By means of connecting mechanism between the thread guide and the tension, the pressure is automatically reduced as the speed traverse of the yarns increases in building up a mass of yarn upon the winding spindle. The rapid traverse of the yarn through the tension causes it to act as a yarn cleaner, throwing off specks, dirt, and loose slubs, thereby improving the quality of the yarn.

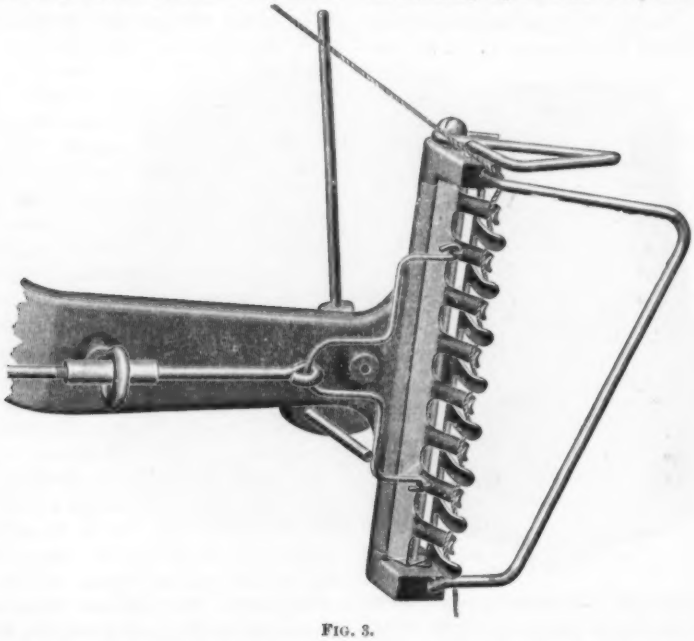


FIG. 3.

—In 1699, the British government issued a decree that "no wool, woolfells, shortlings, morlings, wool flocks, worsted, bay or woolen yarns, cloath, sege, bays, kerseys, says, frizes, druggets, cloath seges, shalloons, or any other drapery stuff or woolen manufactures of any of the English plantations in America shall be laden on any vessel." The object of this decree was to destroy the growing trade in textiles between the different colonies.

WOOLEN DEPARTMENT.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

Finishing Woolen Goods—Old and New Methods Compared.

THE FULLING MILLS.

By a retrospection of fifty years, and comparison of the methods of the "olden times" with those of today, many things worthy of note and consideration are brought to mind, and while there have been many changes in all the processes pertaining to finishing, it is a question whether they may all be counted as improvements.

While it is true that there have been many improvements made in the machinery used, and the methods adopted, yet it seems that the object of some of the modern so called improvements, is rather to save labor and time, than to improve the work.

So far as the change in machinery is concerned, it is doubtful if any greater change has been wrought in any of the processes than in that most important one of fulling.

The writer remembers when this work was done in the old fashioned falling stocks and crank stocks.

These two machines accomplished the work after very nearly the same method.

They had ponderous feet which were forced against the cloth in a case or trough of such a construction that when the feet struck the cloth, the whole mass tended to revolve, and the constant pressure caused the goods to full, while the revolution tended to a uniformity of the work, and in some measure a continual changing of position.

The difference in the two machines consisted in the manner in which the feet were forced against the cloth; in the crank stocks, this was done by a connection of the two feet with a crank shaft underneath which worked them alternately against the cloth. They were virtually, sometimes called "kickers," and were the only kind of kickers ever known by the writer to be of any use in the mill.

The falling stocks were so constructed, that the feet were lifted by a sort of cam arrangement, and allowed to fall with their full weight upon the cloth, which revolved in the same manner as in the crank machine.

Of these two machines, it was considered that the falling stocks did the best work, because the feet always came upon the cloth with equal pressure, stopping only when they had fallen as far as the cloth would allow, while the stroke of the feet in the crank stock was limited to the reach allowed by the crank, and did not always act upon the goods as forcibly and with as uniform pressure as in the other machine.

The soaping of the goods had to be done before they entered the machine, and as soaping machines had not then come into general use, it was usually done by sprinkling the pieces with soap as evenly as possible when spreading and folding the goods over on the floor.

It would perhaps be incorrect to say that the fulling machines and methods have not improved since these old machines were in use, and yet, it is nevertheless true, that they produced, as a rule, a far better, and more compact felt than is obtained by the modern machines.

The fact is, the old fashioned machines were very slow, and the first improvements upon them were improvements only by reason of their time and labor saving qualities which

were at the expense of the quality of the work.

Since the first rotary fulling mill came into use, many improvements have been made, which have rendered it possible to approximate the result of the old machines, and with the rush and hurry of these modern times, the manufacturer has come to value the advantage of time saved above the quality of slower, and consequently more expensive methods; and as his competitors have fallen into line, he could not afford to return to the old methods, even were he inclined to do so.

One of the peculiar features of the old fulling stocks, and one which had very much to do with the excellent quality of the work produced, was the tendency to full the goods in length; in fact, there was no possible way to avoid it. There being no strain lengthwise upon the cloth, as in the rotary mill, the piece must full in length, and only the compactness of the warp and the extra twist it had, hindered it from fulling in the same ratio as the filling.

There was nothing about the machine to control the fulling in length. The shrinkage in length could in a measure be regulated by the construction of the fabric. With a machine fulling both ways in spite of the operator, it is no wonder an excellent felt was obtained. The same results could be secured today, if the manufacturer were willing to sacrifice his woven yardage to the extent that was unavoidable with the old machines.

The old machines gave the best results, because the fulling was in both directions, and so far as pertains to the right principles of obtaining a compact and perfect felt, there never need have been any departure from the way of our fathers.

As already stated, a demand arose for quicker methods. The rotary machine was the result of that demand, and the improved rotary of today is far ahead of the old machines, in their adaptability for the regulation of the work, and arriving at such results as may be desired. With the modern rotary machine the shrinkage in length may be intelligently regulated or, if desired, avoided altogether, an advantage which the old machines did not afford. This together with the saving in time and labor, renders the present machines and methods a great advance over those of fifty years ago.

If the manufacturer were willing to shrink his goods in length as they did in the old stocks, he could get very nearly the same results; I say very nearly, because I still believe that the necessary moderation and low temperature of the old machines, contributed somewhat to the excellence of the results. Were this not so, the manufacturer would not gain anything by using, as is sometimes done, the old fashioned machine, or one accomplishing the work on the same principle, as a finishing touch to his fulling, in other words, fulling in part by the rotary, and then finishing the work in the stocks.

Since the rotary mills have been brought to their present state of perfection, the manufacturer has found the convenience of holding the goods out in length, upon some kinds of work, of marked importance to him, while the possibility of fulling in length when required, and regulating this shrinkage to a nicety are of great value, not only in producing results similar to the felting obtained in the old machines, but in bringing about a uniformity of weight, by shrinking in length such as come light from the loom.

While it is now possible to shrink the goods in length as much, and even more than with the crank or fulling stocks, and thus attain very nearly the same results, yet it is true that there was a quality of firmness to the felt produced by the old methods, which the new machines fail to give. This can be easily accounted for when we remember that, as a rule, other things being equal, the slower the

work the better the result, provided the slowness is not caused by any unfavorable conditions. It is frequently the case, that the finisher gives his rotary mills extra ventilation, so as to retard the work, thereby improving its quality. So with the fulling stocks, the fulling was not only done at a lower temperature, but the slowness of the operation, and absence of a tendency to chafe or wear the cloth, contributed to an excellence which a high speed operation could not produce.

As the railroad express has superseded the old stage coach, and the electric telegraph the old mail wagon, so the tendency of the age is toward the economy of time in all branches of human industry, and the rotary fulling mill has come to stay, with possibilities for still further improvements.

ELMO.

Homespun Yarn and Its Employment in Weaving.

Translated for the Textile World.

Homespun is a name applied originally to yarns spun by hand in the household, and this industry exists today in Germany, Austria, and especially in the Balkan States and the Orient. The best homespuns, such as are obtained in England, come from Scotland, particularly the Scotch Highlands, where they are made on hand looms. The people on the other side of the channel have always shown a partiality for these goods. They esteem them for their durability, and give them credit for at least double the wearing qualities of ordinary fabrics.

The homespun suits are at present much worn there by the best dressers. The cloth here is somewhat thicker, and made from rough, strong yarn. Homespuns figure in both wholesale and retail price lists. London dealers handle them in medium weights of about 19 ounces per yard, at an average price of $1.46 per yard.

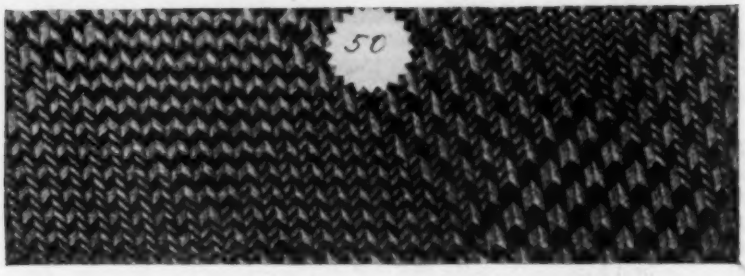
The English, at the Paris Exposition, have included in their exhibits a considerable quantity of homespun fabrics, and as it is likely that owing to these exhibits the cloth will become more popular, it will not be out of place to consider the manufacture of these goods. A wide range of material is used in the manufacture of homespuns, varying from the coarsest to the finest Essex and Leicester wool. The demand for these yarns is so great at present that they are now spun on power machines, although great care must be taken that the yarn does not come out too smooth. The old continuous system of carding with two machines is employed, and this is found to work the stock sufficiently. It would be superfluous to say what method must be adopted to secure this roughness or unequality of the thread. It is the direct opposite to the course taken when smooth yarn is desired.

In recent years, homespuns have become very popular for ladies' goods, so much so, that nearly every lady who wishes to be dressed according to the latest style has one or more homespun costumes. A great portion of these goods are called homespuns on account of the rough, hairy finish, rather than by reason of the inequality and lumpiness of the yarn. They have, in fact, very little in common with the genuine homespun. Homespuns can be divided into two classes: first, wool dyed; and second, piece dyed. Four qualities can also be named: (a) consisting of ordinary wool, to which is often added coarse Buenos Ayres, Prussian and Wurtemberg; (b) cheviot wool of medium quality; (c) comprises a large portion of so-called homespuns which are made with a mixture of wool stock such as Thibets and all kinds of wool waste; (d) consists of a mixture of cashmere, to which is added as much as 50 per cent. of camel's hair. All of these mixtures have in addition a small percentage of coarse hair, bristles or mohair added. The percentage of these last named materials should

not be too small, as a large part falls out during the carding and spinning.

The wool dyed mixtures are made in all possible variations from very light to very dark. Following is a standard mixture: 93% of the ground color; 5% pearl; and 2% mohair. Green, red, orange, violet, blue, yellow, or even two or three of these colors combined, can be substituted for the pearl; two to three per cent. of red works well on a green ground, violet on a blue ground, and red and yellow on a gray ground, etc. These yarns, whether made out of wool or waste, wool dyed or piece dyed, should have from two to four per cent. of mohair, or long wool added. This last named material does not take the dye easily, and, consequently, are easily distinguished in the finished goods by their lustre, and the contrast which they make with the ground stock. The better grades of yarn vary between 2½ and 4 runs, the cheaper grades between 1½ and 2½ runs.

The four-leaf twill is usually used and the selling price varies from 36 to 85 cents per yard, although some special grades run much higher. The patterns consist of large and small checks or stripes, in which light and dark colors are blended, and are brightened by the use of fancy yarns. The colors of warp and filling can be so arranged that they will produce a variegated effect, or have more the appearance of plain goods.—Oesterreichs Woollen & Linen Ind.



Designing Fancy Cassimeres and Worsteds.

ARTICLE IV.

FRED BRADBURY.

An uncommon woven and colored effect is illustrated at Figs. 49 and 50, the former showing the surface, and the latter the back of the cloth. The texture is a reversible worsted cloaking made from a 64s quality of Botany top, i. e., fine Botany wool which is capable of being spun to No. 64s worsted. The weaving particulars are as follows: Warp: 2/56s Botany, 17s reed 8s; 66 inches, width in reed. Filling: 2/56s Botany, 120 picks per inch in loom. Weight per yard finished for

56 inches by 37 inches, 20 ozs.

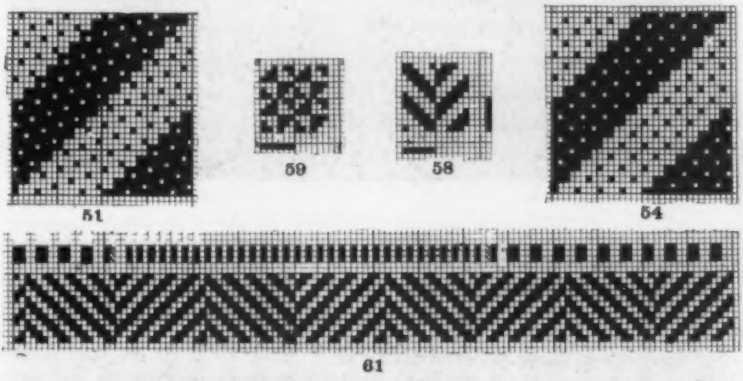
The weave is given at Fig. 51. This method of interlacing may either be considered as a type of weave pattern which belongs to the diagonal class or as having its origin in the principle of double cloth structures.

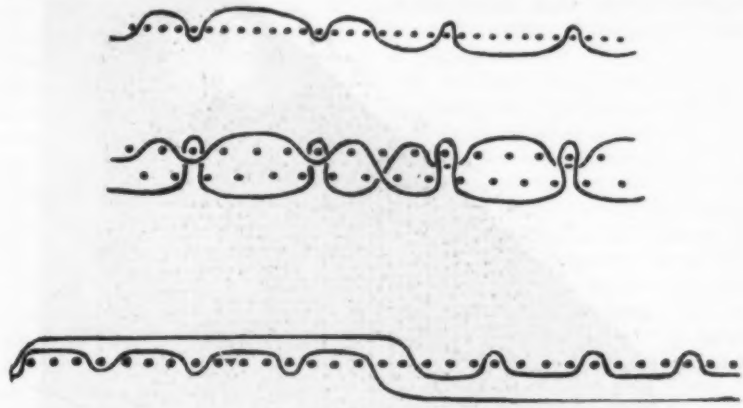
If it is considered as a diagonal pattern, then its production is simply the result of a combination diagonally of an 8-end pure warp sateen alternately with an 8-end pure weft sateen for 16 threads each. If the design plan be considered as a double cloth, then it is really a reversible double cloth produced by a reversion of the 8-end warp sateen alternately with the 8-end weft sateen in diagonal order.

The former method is the simpler, though the color scheme and effect in the woven cloth somewhat incline to the latter principle; the choice, however, is optional. Two cross sections through the warp are shown at Figs. 52 and 53, which are intended to more fully demonstrate the weave principle.

The former treats the weave plan as a single cloth, and shows the insertion of the first pick only, whereas the latter shows it as a double structure, and gives the interlacing of the first and seventeenth picks of weft. In each case the first two picks of plan 50 are shown.

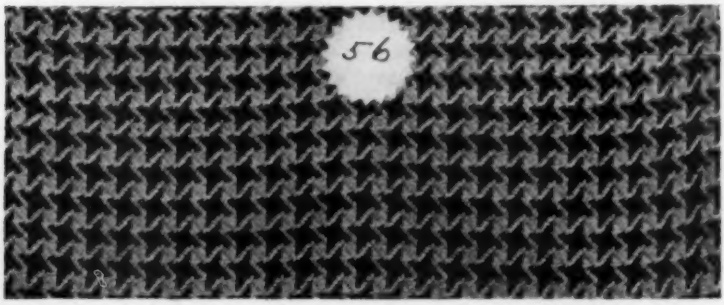
A modified form of the weave plan which is sometimes used is shown at Fig. 54, together with a cross-section through the warp at Fig. 55.

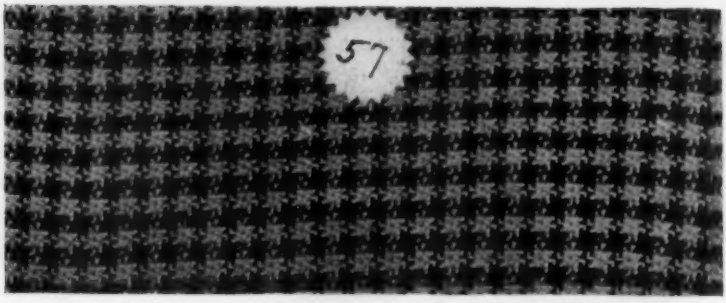


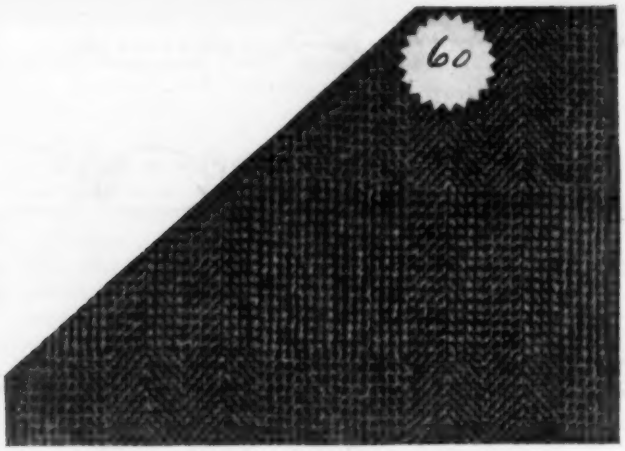


FIGS. 52, 53 AND 55.

A few combinations of other shades which are suitable for this style of cloth, in addition to those given with the pattern just explained, are appended below: 1st warp and weft—dark olive, light smoke; 2d warp and weft—dark purple, lavender; 3d warp and weft—dark brown, brown and steel mixture; 4th warp and weft—navy blue, medium shade of steel mixture; 5th warp and weft—dark brown, dark olive; 6th warp and weft—lavender, white; 7th warp and weft—black, white; 8th warp and weft—brown, white.







Two costume cloths are shown at

Figs. 56 and 57, which are very diverse in effect, though they have been produced in the same loom, from the same counts of warp and weft and with the same coloring.

Usually an increase in the variety of woven patterns, involves an increase in the cost of manufacture on account of the short lengths of warp and small lots of color required, but the prime factor which causes the two diverse productions above mentioned, is the weave, consequently, the advantage in obtaining such results is that variety of pattern can be secured without any additional cost in production.

Weaving particulars for Figs. 56 and 57: Warp—2/24s Botany; 14s reed 4s; 66 inches, width in reed; 60 inches, width of piece out of loom; 56 inches, width of piece finished. Weft—2/24s Botany; 56 picks per inch. Weight per yard finished, 15 ozs. for 56 by 37 inches. The weave for cloth shown at Fig. 56 is given at Fig. 58, and the weave for the cloth supplied at Fig. 57 is given at Fig. 59.

The warping and wefting scheme for each of these cloths is 6 black, 6 white. The order of insertion of these colors with the designs are indicated above and at the sides of each weave plan.

A photograph of a fancy woolen suiting is given at Fig. 60. There is a considerable softness of tone in the coloring of the actual and finished woven fabric, which cannot be shown by a photograph.

Since the warp and filling used in this cloth are of pure woolen, this view is somewhat modified, and is short of the definiteness of effect which the weave and color plan on paper would naturally suggest.

The details of manufacture are as follows: Warp—2¾ run; 42 ends per inch, 10½s reed 4s; 68 inches, width in reed. Filling—2/56 run; 36 picks per inch; 70 yards warp produces 56 yards of finished cloth. Weight per yard for 56 by 37 inches is 19-20 ozs.

Weaving Plan.—One repeat of weave and color is given at Fig. 61. The arrangement of the colors for warp are shown above the design, while the weft scheme commences with the first pick of this design. The draft and peg plan for this weave are respectively shown at Figs. 62 and 63.

The following is the warping arrangement:

2	threads	dark brown	for 16
2	"	white	threads.
1	"	dark brown.	
1	"	cardinal.	
2	"	white.	
1	"	dark brown	for 64
1	"	white	threads.
1	"	cardinal.	
1	"	dark brown.	
2	"	white.	
2	"	dark brown	for 40
2	"	white	threads.

128 threads in pattern.

Stretching Devices in Cloth Drying Machines.

Translated for the Textile World from Oesterreich's Wollen und Leinen Industrie.

It is a disputed question as to what extent the extra length or width obtained by stretching woolen or worsted goods during the process of drying, is permanent. Theoretically, the increase in length or width so obtained would be lost as soon as the goods are again dampened; practically, this is not the case. A certain proportion of the increase in length or width is permanent. This proportion depends on a number of conditions, such as the quality of the stock, weight of the goods, degree of fulling, etc.

In medium weight fabrics, which have received a fair amount of fulling, most of the increase is preserved. Fabrics that have been fulled but little, will frequently not only lose all of the increase in length obtained by stretching, but actually become shorter and narrower than they were before drying. This is due to the fact that their felting or shrinking capacity had not become exhausted. Heavy, strong fulled goods show a very strong tendency to return to their original dimensions. This tendency is diminished by gigging.

The fact that the length and width of goods can be permanently increased by stretching during the drying process, affords a partial remedy for excessive shrinkage in fulling. If the

goods have been fulled too much in their width or length, this fault can be remedied by stretching them out again. The extent to which they are stretched must, however, be much more than the actual increase desired, as much of the temporary increase of length is lost in the subsequent processes. In order, for instance, to make goods two inches wider than the original dimension, it is necessary that the original width should be stretched at least eight or ten inches.

Still more important that the widening of the pieces is the stretching lengthwise. Very frequently it happens that pieces come from the fulling room much shorter than they should be. This adds materially to the cost per yard of the cloth, and either wipes out the profit or causes an actual loss on the goods, especially at the present time, when prices are so low.

The builders of drying machinery have added various devices to their dryers, by which the operator can regulate this stretching in length. One of these devices consist of a large face plate, to which a friction cone is connected. Another method consists in running the cloth over two rollers, running at different speeds. The more recent German drying machines have a dial which indicates the amount of stretch applied to the goods.

In order to determine how much a piece should be stretched, it is necessary to know the clean weight, the length of the piece before drying, and the required weight per yard. Calculations are made for each piece before it is fulled, to determine what length it should have when finished, in order to get the desired weight per yard. When the wet pieces which have been fulled, scoured, and gigged, are ready for the dryer, they are first carefully measured, and this length is compared with the length which they should have when finished. This comparison shows whether the goods should be stretched or not, and the stretching mechanism on the dryer is adjusted accordingly.

As stated before, a piece must be stretched considerably more on the dryer than the desired increase in length. If, for instance, a cut 24 yards long is one yard short, the piece must be stretched at least 2 or 2½ yards, in order to obtain this one yard increase. This means that the cloth is stretched from eight to ten per cent. If an increase of a half a yard is desired, the stretching of four or five per cent. will be sufficient. Where an increase of more than one yard is desired, the wet goods on the dryer will have to be stretched still more in proportion to the increase desired in the finished piece. For instance, the permanent increase of one yard in length necessitates the stretching of the piece from 2 to 2½ times this amount on the dryer, but if an increase of 1½ yards is desired, the stretch on the dryer must be at least three times this amount.

As one can see, the process is rather simple, the difficulty being chiefly to ascertain how much the goods should be stretched on the dryer, in order to give the desired increase in length. In this, as in other departments of textile manufacturing, experience is the best teacher, and it is only by experimenting that one can determine the best method of utilizing this process.

If medium and heavy weight goods are to be stretched to any considerable extent, it is a good plan not to extract the goods, but to dry them while saturated with water. The advantage arising from this method, is probably due to the fact that the evaporation of a large amount of water in the goods has an effect similar to the process of sponging or crabbing goods, by which the fibre is fixed and loses the tendency to return to its original contracted condition. A greater proportion of increase of length obtained by stretching on the dryer, is made permanent if the goods are immediately crabbed or steam blown after drying.

In cases where a large increase of length is desired, repeated drying and steam blowing will be found to give good results.

KNITTING DEPARTMENT.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

The Knit Goods Situation.

The feeling of disappointment over the present situation among dealers in knit goods, is due to the extravagant anticipations before election as to what would follow the election of McKinley, and to the unavoidable contrast between the amount of business today and the same time last year when the "boom" was at its height. A year ago, the craze to buy was in full swing. Both jobbers and retailers were making heavy purchases, anticipating their imaginary needs far into the future. The heavy stocks then accumulated have not yet been purchased by the consumers.

There is the usual fault finding about the weather. There is no doubt but that the disposition to purchase is largely influenced by the temperature. It is hard work for a merchant to buy winter underwear or hosiery on a warm day; consequently, when a cold snap comes along, the retailers rush to the jobbing houses to replenish their stock of seasonable goods. This has always been, and probably always will be, a feature of the trade.

A fair business is being done in seasonable goods, and if it were not for the comparisons between present and past conditions, between hopes and facts, the business of today would be the cause of much satisfaction.

In hosiery, the popularity of fancy goods has been of greatest benefit to importers. American knitters are making great progress in supplying the demand for the better grades of goods, which have heretofore been imported from Europe; but, we have not yet reached the point where we can compete with the German in fancy hosiery of the better grades such as buyers now demand. The domestic knitter has a better chance on seasonable goods, as fancies are called for only in spring styles. There is but little doubt but that fancies will run another year. Vertical stripes will be the thing. Unfortunately for home industry, this is the style our machines cannot make, and we must look abroad for vertical stripes knit in the goods. These vertical effects can be produced by printing or extracting the color, and our own makers will have to rely mainly on this process and on the vertical lace effects.

The same general conditions in hosiery trade are found also in underwear. In spite of the dissatisfaction with the cheaper fleece lined garments, which have been voiced so loudly, there is a large business done in these goods. Union garments are coming into favor all the time. It is an acquired taste to a large extent, and will have to await a course of education.

A slight tendency toward fancy underwear is in evidence, and some effective styles have been made by the use of mercerized yarn.

It is fortunate for everyone in the trade that there is no sign of a boom. Manufacturers and dealers are in close touch with the consumer who is not enthusing to any great extent. The consumer is an individual who buys only as he is compelled to. All of his purchases mean a total loss to him. A striking illustration of this is seen in the prosperity of a concern who puts new feet on old stockings. We do not think this industry will affect the knitting industry to any great extent, but the fact of its existence illustrates the consumer's mood.

Reports from foreign markets state that a hand-to-mouth policy is being followed there. The rise in cotton

yarn has served to reduce purchasing and manufacturing of goods. Productive capacity exceeds purchasing power of the consumer to even a greater extent abroad than here. Any substantial improvement in present business conditions must be preceded by an increase in the power of the consumer to purchase, and in the meantime it will be well if manufacturers and dealers continue in their present conservative mood, keeping their operations in line with the legitimate demands of trade.

Extracted Hosiery.

The production of fancy hosiery has attracted considerable attention of late on the part of our domestic manufacturers, especially since large invoices of the output of many European mills have been received in this country, and which find a ready sale on account of the general attractiveness of the patterns offered, which mainly consist of the harmonious blending of colors upon a ground of some plain or body color.

Formerly, and for a long time such fancy shades upon hosiery were wholly obtained by the use of variously dyed yarns, but of recent years a much simpler process has been put in practice, which enables the manufacturer to turn out a line of goods equally as attractive, and at a considerable reduction of cost, besides allowing of as many changes in the colors without the expense of making special dyeings.

The styles of hosiery that have been offered are the result of one of two chief processes, each of which is very simple. The first process may be illustrated by taking as an example a black sock with red dots. These dots, of whatever size, may be put upon the article in two ways, one by printing upon the previously dye sock a printing paste containing a red pigment, which is fixed by means of albumen and subsequent steaming; or, a red spot may be printed on the black sock by means of a red discharge paste, which by the action of certain chemicals destroys the black, and at the same time fixes more or less permanently the red coloring matter, which in this case is a coal tar dyestuff. This fixation is accomplished by means of steaming and washing.

These two processes yield results which are similar in effects, but widely different in durability, the former, as may be imagined, will not resist frequent washings, while the latter is as durable as the goods to which it is applied.

In the fixation of pigments upon dyed fabrics, the widest latitude is allowed the dyer in the choice of ground colors, as the insoluble colors are applied in exactly the same manner as printing ink or paint would be; but, in using the discharge process, which, by far, yields the cleanest and most durable results, considerable attention must be given to the choice of colors for the body of the goods, or else some products might be chosen that will not be acted upon by the discharge chemicals employed.

Ever since the direct dyeing colors have been before the dyers and printers, much originality has been displayed in making discharge effects, as the majority of them are readily discharged by either tin-crystals or zinc dust, the two most commonly used agents. In carrying out the process, the hosiery is dyed in the usual manner with such combinations of dyestuffs as will produce the desired ground color, whether light or dark, and with such dyeing assistants as may be found necessary. The following general scheme is found to work well in practice for the various depths of shades:

For light shades, dye with from 2 to 5% phosphate of soda, and 1 to 3% soap or soda. For medium shades, dye with 1 to 2% soda and 5 to 10% Glauber's salt, and at a temperature under the boil. For heavy shades and blacks, 1 to 2% soda, and 15 to 25% Glauber's salt.

After having been dyed, the hosiery is washed thoroughly and dried on

boards right side out, when it is ready to be printed upon.

METHOD OF DISCHARGING WITH TIN CRYSTALS.

Body or ground colors that are available for this process are the following: Diamine Yellow N; Diamine Gold; Diamine Orange D and D C; Diamine Rose BD; Diamine Red 10B; Diamine Brown M and B; Diamine Bronze G; Diamine Catechine G and B; Diamine Blues, including Pure Blue; Diamine Brilliant Blue G; Diamine Sky Blue F F; Diaminogen Blue B B; Diamine Dark Blue R and B; Diamine Green B and G; Diamine Gray G; Oxy Diamine Blacks A and N F; Diamine Black Blue B, and many other products, including such as are capable of being diazotized and developed to a black with B-Naphthol, as all of the latter are easily discharged with tin.

Discharge pastes are all founded upon one principle: that of effectively discharging the body color to a white or nearly so; such a paste is called a "White Discharge." When the same discharge is modified so as to include a basic color, or a color that is not destroyed by the discharge chemicals, such a discharge paste then becomes a colored one.

For short steaming, such as is usual for hosiery, the following is found excellent for white discharges: 60 parts Acetate of Tin (28½° Tw.), 18 parts Wheat Starch, 24 parts White Dextrine, 3.6 parts Citric Acid, 36 parts Tin Crystals, 9 parts Acetate of Sodium.

Acetate of tin may be purchased, but as it should be used strictly fresh, it is best prepared when wanted by dissolving freshly precipitated oxide of tin in the smallest amount of glacial acetic acid, and diluting to 28½° Tw.

Another similar white discharge (but on account of its slower action is preferable where steaming is to be done at low pressure, thereby requiring longer time), is prepared by mixing together: 60 parts Water, 30 parts Wheat Starch, 24 parts White Dextrine, 3.6 parts Citric Acid, 36 parts Tin Crystals, 9 parts Acetate of Sodium. Print by means of blocks, or by passing the boards with the hose on them through a horizontal roller machine; allow to partially dry and steam for 10 to 25 minutes at low pressure, and wash well and finish.

For Colored Discharges, the following formula will be found to answer nearly all purposes: 8 parts Acetic Acid 11° Tw., 4 parts Tartaric Acid, 10 parts Gum Dextrine Paste, 50 parts of either of the two previously described White Discharges, 7 to 15 parts Tannic Acid, 1½ to 3 parts Tartaric Acid, 6 to 10 parts Water. The last three ingredients are mixed separately, and added to the paste proper.

When all the ingredients are thoroughly incorporated, add a solution of such basic dyestuff as the character of the discharge calls for, in the following proportion: 3 to 6 parts Basic Dyestuff, dissolved in 8 parts Water. Mix well, and apply to the dry hosiery by means of a block (prevailing European custom), steam, and pass through a dilute solution of antimony salt, heated to about 90° F., lift, wash and finish.

The dyestuffs that are available for mixing with the discharge paste are included in the following list: Thioflavine T, any of the Safranines for Reds, and of the Fuchsines for Reds, the Rhodamines for Pinks, Methylene Blues of various shades, Methyl Violets.

While for brilliant light reds and pinks, the Eosines, Phloxines and Erythrosines give good results; but when these are used, it will be necessary to use Acetate of Chrome in place of Tannic Acid in the discharge mixture.

Zinc dust discharges are important, only on account of their simplicity and ease of working, but are only useful for white effects, as colors do not work well with them. For white spots or stripes on blacks or browns, they

are of great value. A good mixture is as follows: 2 parts Pure Zinc dust, 3¾ parts Dextrine paste (1:1), ⅝ parts Sodium Hyposulphite (71° Tw.). Another practical mixture, and one much used for all direct colors, is: 1⅝ parts Zinc dust, 2 parts Dextrine paste, ½ part Ammonia (0.91 Sp. Ex.), ⅝ parts Sodium Hyposulphite. These must be well mixed and ground together; first, steam for ½ hour, wash in water containing a small quantity of hydrochloric acid, rinse in clear water and finish.

The most important piece of apparatus to carry out the workings of the process of discharging these goods is a steam-box, and for hosiery the square or rectangular cast-iron box has many advantages over any other form; it is simple in construction and cheap. It is constructed of segments bolted together with a hinged door large enough to allow a carriage to enter, carrying the printed goods. These steam-boxes are not kept in stock, as a rule, but are cast as ordered, by makers of calico printers' machinery. They are fitted with a steam gauge, a safety valve, steam inlet pipes and a drip. The carriages may be of wood or wrought-iron, mounted on six small wheels, and of such size as to accommodate a very large quantity of hosiery.

Pigment printing, not having the durability of the discharge colors, is of less importance. The base of the paste is either egg or blood albumen, softened in warm (not hot) water until it becomes quite thick, when a mineral pigment or lake of the desired color or combination of colors is thoroughly stirred into the mass; this, then, forms the printing paste, which can be applied to the goods by means of a block having a pattern, usually of dots; the hosiery is then dried and steamed.

The steaming causes the albumen to coagulate (just as an egg hardens when boiled), and the color then becomes fixed to the fibres.

These pigment colors are quite fast, but do not at all compare with the discharge colors, and besides they are not nearly so bright.

"BETA NAPHTHOL."

Sewing Machines in Underwear Mills.

PLAIN FINISHING MACHINES.

No. IV.

(Continued from November.)

Plain finishing machines for sewing on drawer, shirt or vest facings, button stays, etc., may be either chain or lock stich, as the material is non-elastic and does not require such formation of stitch as in the machines described in previous articles. The "old line" lock stitch machines have to some extent, been used for such a purpose, but as their speed is limited and because of other reasons, they were not popular.

The chain stitch machines have usually been adopted to perform the greater portion of this work, on account of high speed and durability, especially where an ornamental stitch is desired, as on vest facings and drawer facings. One type of plain finishing machines, designed and built by the "Union Special" for finishing knitted vests makes either the two-thread chain or "Safe Elastic Stitch," or the single thread chain stitch, thus giving it the capacity of both a single and double chain stitch machine. The change can be easily and quickly made. It can be run at a high rate of speed, has ample room under the arm, and is durable, and cost of maintaining very small. It has no hook, nor has it a shuttle to thread or bobbin to wind, but takes the thread directly from the bobbin.

Another machine of this same type, designed for finishing knit drawers, is built on similar lines, with the same characteristics. In stitching on an inside band, where a silk finish is desired, this machine makes a beautiful ornamental stitch, greatly adding to the appearance of the garment. A large saving of silk thread is effected by using cotton thread in needle and

having sufficient tension to draw the cotton thread so that only the silk will show, giving an effect of two silk threads. These machines are capable of running at a high rate of speed, with very little trouble and cost of repairs.

Another type of finishing machines is a high speed lock-stitch machine, recently introduced by the "Willcox & Gibbs," who designed and constructed it to secure the greatest possible speed, durability, and perfection of work. It is really a long step forward in lock stitch sewing mechanism, embodying, as it does, high speed, perfection of stitch and tension, and yet simple and durable and adapted to the most delicate of fabrics, as well as to the heavier materials. It runs at a speed of 3,000 to 4,000 stitches per minute, driven with a small round belt, which indicates how light it must run. It has proven its worth, and many manufacturers are already using it with success and satisfaction. It is constructed on the same system as the "Overlock" machines, both being built by the same company. The design is radically different from the well known W. & G. style, being more in line with the lock-stitch machine using a hook. The belt principle of driving the hook shaft is novel in its application, so, too, is the take-up, both being a departure from lines heretofore followed in lock-stitch sewing machine building.

The Willcox & Gibbs chain stitch finishing machines are popular for binding, being especially adapted for that purpose. They are furnished with either automatic or friction tensions, with tight wheel, or tight and loose pulley, with one line or two line feed surface, or with the Registering Measuring Tension. The object of the latter is, to measure and give out the exact amount of thread required for each stitch; to uniformly draw up each stitch to any desired tightness; and produces sewing that is exactly right, requiring no judgment on the part of the operator; it can be readily adjusted and produces a seam of unvarying tightness and elasticity.

The thread cutter attached to the washer of the looper of this machine is worthy of note, because it obviates the too ready tendency of this type of stitching to ravel. By it the thread is properly cut when the work is taken from the machine, leaving about 3-8 of an inch on the under side and drawn through the last loop, which "fastens off" the seam and prevents raveling of the stitch; it can be made doubly secure by pulling the end, which is through the last loop, toward the sewing. The cutting is accomplished by a slight forward and backward movement of the wheel, when, as usual, the operator turns it to raise the needle.

The Singer Manufacturing Company build and market a chain stitch machine with the same method of forming the loop as the W. & G., and with more room under the arm than any other style of this type of machine. The feed mechanism has a positive movement, and the length of stitch is easily adjusted without the use of springs. The automatic tension device is excellent, and like other styles of this type of machine, the stitch is formed from a single thread which is interwoven into a chain on the under side of fabric. The thread may be drawn closely to the fabric, forming a tight or flat seam, or it may be left in an elastic chain as desired. A beautiful stitch, resembling braid, may be produced by using coarse silk, a style of finish often desirable on knitted fabrics.

The Kruse & Murphy Company still make the old style single thread machine adapted for plain finishing. They also make this machine with positive feed and all wearing parts hardened and ground, so that it is capable of running at a very high rate of speed.

MET.

(To be continued.)

Improvements in English Knitting Machines.

Among numerous improvements in knitting machines, writes the U. S. consul at Nottingham, Eng., which have reached the practical stage, but have hardly attracted the attention even on that side which their merit seems to warrant, and are practically unknown in the United States, are the "Maximum" knitting machine and the Bettney improved splicing mechanism, which he describes as follows:

The "Maximum" is a vertical latch-needle straight-bar frame, in six divisions or more, for producing fashioned shirts and pants. The article produced is selvaged, same as a patent, and not a circular-fashioned article, and requires to be seamed on the "Kochler" or some other seaming machine, or can be seamed by hand, if required.

The article to be made is commenced on its narrowest width when desired to fashion; the fashioning "clawker" is thrown in while the machine is running, and it commences to raise fresh needles into work on either side, by every 2, 4, 6, 8, 10 or 12 courses or more, according to the shape required.

Splicing can be applied anywhere and to any part simply by dropping a lever. The frame runs at 45 to 50 traverses a minute on its full width—say 32 inches—and, having two cam boxes to each division, makes 90 to 100 courses a minute. This, it will be seen, doubles the production of the old machine, provided the latter should go as fast.

The great feature of this frame is that the cams traverse only the actual width of the fabric being knitted. Thus, if working on 16 inches, the traverse is only 16 inches, and on every widening that takes place the traverse is automatically increased; when not fashioning, the traverse does not increase. By this means, another 33 per cent. is claimed to be added to the production over and above the speed already quoted. In addition to this, there is an overhead variable drive, which, as the fabric is widened, automatically slows down till the full width of the division is attained. By this means, the inch speed is maintained throughout.

On 16 inches, the speed is double that of the speed on 32 inches, the result being that as many superficial feet of fabric are produced on the 16-inch width as on the 32-inch width; or as many pounds of yarn can be worked up in a day on a narrow width as on the full width, thus giving a further increase of, say, 25 per cent. over the production previously mentioned.

The goods produced are practically equal to Cottons patent work. The Maximum machine is unique in the following respects: (1) It traverses only the actual distance being knitted. (2) It produces as much fabric off a narrow width as off a wider width. (3) It produces a quantity of fashioned spliced goods equal to the production of the cut circulars, and there is no waste in cutting out.

After arriving at the desired width, the three actions—the expanding traverse, the decreasing speed, the extra needles brought into work by widening—being all geared up together, are wound back by the operator by the turn of a wheel to the width it is desired to begin on. Thus the traverse is reduced, the speed increased accordingly, and the extra needles brought into work by fashioning are thrown out of work.

When the fabric attains its full width, unless the fashioning lever is raised—thus making straight work—the machine will stop automatically, so as to prevent overfashioning.

Six machines have been in operation here for six months or so, and considerable quantities of goods have been placed on English and colonial markets. Patents have been taken out here, in Germany, France, Canada, and the United States.

The Bettney splicing mechanism

consists of an improved splicing mechanism applicable to circular bearded needle knitting machines of the kind often known as web heads and making a web which is largely used for vests and pants (undershirts and drawers).

To each feeder on the head, a splicing mechanism is applied. This comprises a bladed wheel with blades specially cut to insure the thread being thrown in and out of action at particular needles. There is also a thread cutter and a holder for securing the cut ends of the thread. The splicing thread is thrown into and out of work by a cam on the needle cylinder, this cam being arranged according to the number of needles upon which the work is to be spliced, and also according to the number of feeders, while the number of courses spliced is controlled by a single pattern cam mechanism.

Seconds in a Hosiery Mill.

An important item in the cost of knit goods, and which has an important bearing on profit and loss account, is the number of seconds. It is a well-known fact to those familiar with the hosiery business, that it costs more to make seconds that are unsalable than it does to manufacture perfect goods. Imperfect yarn is the first of the many causes of seconds that we will consider. If the buyer realizes the effects of inferior yarn he will not be so ready to buy cheap lots at temptingly low figures, which often result in a cost for the finished garment, much higher than if first-class yarn at full market prices had been purchased.

The writer recalls one lot of inferior yarn which it was his misfortune to handle. A sample case came into the mill with the usual request to test it and report. After this yarn had been on the machine for some days, and I had listened to the complaints of the winders and spent two or three hours of time which could be much better employed elsewhere, in watching the machine and trying to adjust it to make the work go, I reported to the purchasing agent that the yarn would be unprofitable to buy at any price; but that official did not look at it in the same light, and in the course of a few weeks the stuff arrived, "Only a small lot of 20,000 pounds," as the buyer expressed it, and bought at six cents below what yarn of that number was selling for. He told me it might be a little more trouble to work the yarn, but the difference in the cost would more than make up for the trouble.

After the winders had worked on this yarn for several days, doing their best to handle it, they refused to work on it any longer, and in the course of three weeks I had lost four of the best hands in the mill. A large amount of waste had been made, and great dissatisfaction caused in the knitting room.

Finally, it was decided to put two winders on this yarn and pay them by the day. This was done, and a record was kept as to the waste made, and time spent in winding. The average cost of winding was three cents per pound, while the waste amounted to 15⅓ pounds for every 100 pounds of yarn wound, thus adding 3⅝ cents per pound to the cost of the yarn, which, with the extra cost for winding, made a total increased cost of 5⅝ cents per pound, before the yarn had gone to the knitting room.

It was knit into goods weighing 28 ounces to the dozen, and the whole lot, which originally weighed 20,000 pounds, produced 6827 dozens of goods, that were sold at 70 cents per dozen, or $4,778.80. The first cost of the yarn was $4880, so that this job lot purchased at a great bargain of six cents below the market price, caused a loss equal to more than the whole cost of manufacturing. These are facts, and can be substantiated by the records of the mill. They show very clearly how important it is to select the proper material for the manufacture of hosiery.

FOREMAN.

Plan for Underwear Mill.

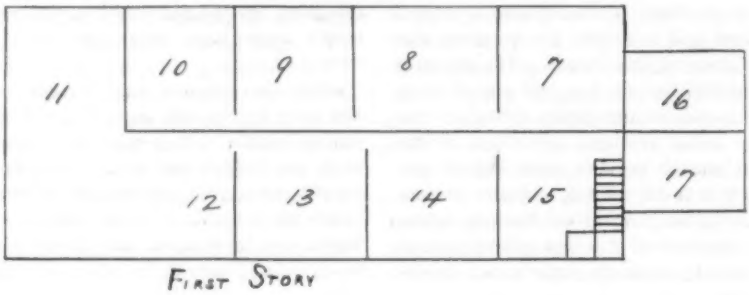
Editor Textile World:

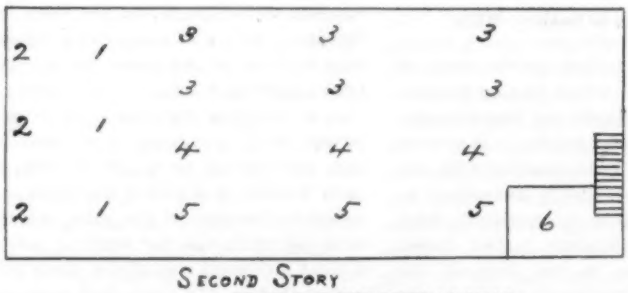
I have been much interested in the articles on the arrangement of rooms and machinery for hosiery mills. I enclose a plan for an underwear mill, which embodies ideas that I have gained during a long experience in mill management.

I have recently returned from a trip to the Southern States, where I was called to advise as to the building and equipment of a knitting mill. I found the promoters fully alive to the importance of having this work well done.

Second-hand buildings and machinery find no favor in the South, and the low cost of Southern goods will in the future be due in great measure to the mills having been conveniently arranged and equipped with the latest and best machinery.

The accompanying diagram shows an arrangement of rooms for an underwear mill where the yarn is purchased. The rooms in which the successive processes are carried on, have been so arranged that very little transportation of goods is necessary. The main entrance is located in plain view of the office. Back of the office are the wash and bleaching rooms; next comes dyehouse, drying room, brushing and napper-room, and the packing room can be located on same floor by the use of a small elevator. The engine and boilers are located in a one-story ell.





PLAN FOR UNDERWEAR MILL.

1 Winders, 2 Knitting, 3 Seaming and Finishing, 4 Trimming, Folding, Pressing, Inspecting, Packing, 5 Finishing Tables, 6 Superintendent's Office, 7 Washing and Bleaching, 8 Dye House, 9 Drying, 10 Brushing and Napping, 11 Store Room, 12 Machine Shop, 13 Packing Room, 14 Shipping Room, 15 Office, 16 Boiler, 17 Engine.

The second story is arranged for the knitting, winding, mending, cutting, seaming, finishing, inspecting, folding and pressing, boxing, packing and supply room and office for superintendent.

After goods are mended, either in the roll or in the dozens, a trap door, or hatchway, may be raised, and the goods thrown down to the wash room, and when washed, passed from there to the dyehouse. When dyed and napped, they may be carried up by a dummy to the floor above, where the cutting and mending is done.

OLD SUPERINTENDENT.

SILK DEPARTMENT.

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Concerning the Color-Matching of Some Dyed Silk Fabrics.

DAVID PATERSON, F. C. S.

In the great majority of dyed fabrics, such as rugs and carpets, calico prints, hosiery, upholstery, etc., the dyer, or color mixer pays little heed to the question of how the colors appear when viewed under an artificial light such as gas, oil lamp or electric light.

If any of the dye colors appear greatly modified under the artificial illumination, we at once conclude that they could not be made to look otherwise. But every observant dyer and color chemist must have noticed that two dyed fabrics which appear identical in color in daylight, may present a very wide difference in color under gas light. They resemble each other no longer.

As a rule, the majority of dyers have little occasion to pay any heed to how their colors behave under an artificial light. If the colors are dyed to match the required material in daylight, then we think we have fully accomplished all that can be asked of us. And, in the great majority of cases, an abnormal modification of hue under gas light is of little or no importance.

But, when we consider the dyeing of some silk fabrics, such as trimmings and facings for dresses, the case is a very different and also a difficult one. The dyer of such articles must make his shades to match the sample even in artificial light. The dyer of silk trimmings, facings, bindings, or linings and other similar silk goods for ladies' wear, generally gets a piece of dyed cloth,—the material of which the dress is to be made—and to this he must match his dyed silk.

Silk is one of the most difficult of all fibres to dye to an exact shade. Its optical properties, i. e., its lustre and transparency, so modify the appearance of the dyes and give the coloring matters free scope for exhibiting their own optical peculiarities, such as dichroisms and fluorescence, that silk dyers experience the greatest difficulty in bringing up their shades to the required standard.

Not only does the varying quality of the daylight affect the appearance of dyed silk, but any little peculiarities of hue, or optical behavior, in any of the dyes, become greatly accentuated under a yellow illuminant like gas or lamp light. Here, then, arises a special difficulty in the color matching of dyed silk fabrics, of which the ordinary dyer, who works with the less lustrous fibres like wool and cotton, fortunately has little or no experience.

Suppose, for example, that the silk dyer gets a piece of woolen dress material, dyed of a brownish drab shade. This shade has been obtained with an aniline orange or yellow Induline, and perhaps a touch of a Methyl Violet to sadden. He then dyes his silk linings to match the desired shade, and employs a yellow or an orange, and a greenish blue like Cyanine Blue or Wool Green to sadden with, instead of a gray-like Induline. By employing these dyestuffs, a very satisfactory match may be obtained, perfect as regards their aspect in daylight, but when viewed in gaslight their appearance will be altogether different.

The woolen dress material will probably show an inclination to become redder, while the silk material will show a tendency to appear much greener. The result of this wide difference in behavior is that they appear very unlike each other under an artificial light. Many such examples beset the silk dyers, and from the num-

ber of communications received by the writer from them, it is very evident that the difficulty in matching dyed silks is very generally felt.

Were the dyer of the dress materials also the dyer of the silk facings, then little or no difficulty would be experienced; as the same color stuffs employed for dyeing the one could also be used in the dyeing of the other. So that, no matter how the dress material changed in aspect in gaslight, the dyed silk would also change in a similar manner, and thus match each other under any illumination.

But the dyer of the woolen dress material is a different person from the silk dyer, and the latter has to make his shades to match in every respect the dress article; this involves great difficulties, which only the experienced dyer and colorist can fully understand.

In all cases where the "gas light" aspect of dyed shades is of importance, I would strongly recommend to all dyers the use of the orange film. This consists of a gelatine film tinted orange, which, if it be of the proper depth of color, gives the gas light aspect to the shades examined under it. This saves the necessity of having a room specially fitted up with gas or lamp light for such experiments.

On viewing the shades through this orange tinted medium, it will be at once observed how they behave under an artificial illuminant. The writer employs several tinted mediums for careful color matching, and finds their aid often invaluable, as they reveal at once optical peculiarities in shades, which perhaps would be noticed only after it was too late. It is an excellent practice, which many ladies adopt, of selecting under an artificial illuminant all their dress materials which they intend to wear in gas light. In this way they see how the color of the material changes before they get it made up, and thus disappointment is often avoided.

In order to study thoroughly this interesting subject of color modification

FIG. 1.

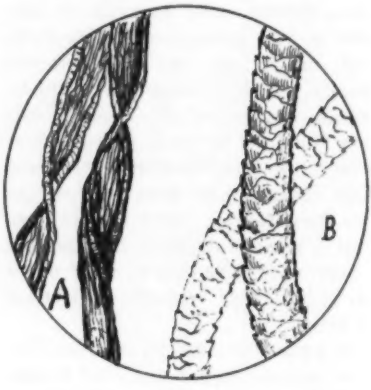


FIG. 2.

under the various artificial lights, it is necessary to make a careful spectroscopic examination of the various dyestuffs employed in the making of the shade, and also to observe the effect of the lustre and transparency of the fibre on the coloring matters. After some experience, the dyer can make for himself a list of dyestuffs which produce certain results when dyed on silk, and viewed under gas light, and thus have at his hand a ready guide to aid him in producing any desired effects.

It will be found that the more lustrous the fibre the more difficult it is to match accurately, and this holds true vice versa also. For example, cotton and linen, when dyed, resemble more the opaque nature of paints and pigments, which show little change under the varying qualities of the

light which illumines them; on the other hand, dyed silk, China grass, or the Ramie fibre—which is as lustrous as silk—and the finer lustred wools are all more difficult to match than cotton or linen.

The non-lustred fibres scatter the colored light from their rougher surfaces, and the resultant color resembles, in nature and properties, that of a pigment painted upon a surface like paper, while the colored light, which comes from dyed silk, resembles more in its properties, the light transmitted through, and reflected from, a dye solution in a glass tube.

The beautifully even and polished surface of the silk fibre, as compared with the rugged and rough fibre of cotton and wool, can readily be observed by viewing them under the microscope, and it is owing to these optical and physical differences that we experience so much difficulty in matching them when dyed. In our illustration, Fig. 1 gives the appearance of the silk fibre under the microscope, showing its smooth, polished surface, which gives rise to the high reflective property termed lustre. Fig. 2 illustrates the appearances of cotton (A) and of a non-lustre wool (B), which shows the great difference in the outward appearance between them and silk.

It is readily seen how the light becomes broken up and scattered from the rough edges and uneven surfaces of the wool and the cotton fibres. In the case of dyed non-lustre fibres the light cannot enter deeply into the body of the fibre, and thus the colored light on being reflected is not of a very rich or saturated color, whilst with silk the light enters through the fibre and becomes reflected from the inner surfaces, and is thus dyed of a deeper and richer color.

Many silk dyers experience the greatest difficulty in arranging a good position for obtaining the best daylight for their color matching. Daylight varies greatly in its nature and there is scarcely a day passes but the careful color matcher finds that the light has altered in its hue two or three times in the course of the day.

The writer has himself observed some of the delicate mode or fashion hues change their appearance in morning, noon and afternoon, so sensitive are they to the slightest variation in the quality of the daylight. No hard and fast rules can be given on the subject of matching dyed silks, only that it requires very special care, both as regards the selection of the daylight and also in the selection of the dyestuffs to dye the desired color.

Calculation of Silk Goods.

LUDWIG BRAUN.

(Continued from November.)

In the November issue we referred to the Turin and International systems of silk yarn numeration, and gave examples to illustrate the method of calculation for each.

There is, however, another and more simple method for rapid calculation of the weight of warp in raw silk. We start with the size of Turin and do not express the length of the warp in metres but in "bouts," a "bout" being equal to 4 metres in length. In the above formula if we take instead of 2 00 metres, 25 bouts, we can reduce the expression of the formula as follows: [No. of threads × Deniers (Tur.) × bouts] ÷ 2000; or in our example (8000 × 20 × 25) ÷ 2000 = 2000 kilogr. inclusive of 7½% loss.

The difference between the two results proceeds from the fact that we have reckoned above 5% loss. We can still further simplify the formula especially in theoretical calculation if we take always a length of 80 metres = 20 bouts. It is evident that this figure will be cancelled by the denominator, and we have to strike off from the result only two ciphers. In the above example we have only to multiply 8000 by 20 = 1.600 kilogr. for 80 metres, and 2 kil. for 100 metres.

In a similar manner we can simplify the formula for the weft. In

this formula it is necessary to note down always the No. of picks per 3½ centimetres: [Length × width × picks per 3½ centimetres × deniers (Turin)] ÷ 27,000.

The result contains 12½% loss.

Another method for finding the weight of weft is as follows: we take as foundation the International size, which is based on a length of 500 metres and a weight in deniers of 1/20 gr. It results that one thread of 1 den. in one gram has a length of 10,000 metres, after the subtraction of 10% loss = 9000 metres; if we divide 9000 by the No. of deniers of the silk we get the No. of metres which contains 1 gr. of this silk. From this we derive the following statement:

? gr. weft to	80 metr. fabric
1 metr.	3500 picks
1 pick	0.6 centim. width
500 metr.	30 den. Internat'l
1 den. Internat'l	0.05 gr.
9000	10,000 at 10% loss

We can shorten this statement thus: (80 m × 3500 picks × 0.60 m) ÷ 300. The figure 300 is produced by 9000 ÷ 30 den.

Spun silk at present much used in the silk industry, is reeled on the theoretical system everywhere with the exception of England. One hank is 500 metres in length and calculated for ½ kilo. Of this we give an example. How many kilogrs. are necessary for a warp of 3000 threads, 60 in. in length and 140 ÷ 2 fold spun silk? This last = 70 hanks a 1000 net. per kilo. 3000 × 60 = 180,000 m. are necessary in length ÷ 70,000 metres per kilo spun-silk = 2 kilo. 570 gr.

Fine or Coarse Numbers for Silk Fabrics.

Translated for the Textile World from the Berlin Textil-Zeitung.

In no branch of textile manufacturing has the manufacturer so large a number of grades and sizes of yarn available for the same class of goods, as in the silk industry. In manufacturing woolen, cotton and linen fabrics, one is restricted within very narrow limits, as regards the fineness of texture and size of yarns for a particular cloth, in order to insure salable goods and economical working of the stock in the mill.

With silk, however, the choice of material is nearly unrestricted, and a great many different qualities of goods can be woven from the same warp, by simply changing the size and quality of the filling. In considering the question of whether to use fine or coarse yarns for silk fabrics, two methods of manufacture form a decided contrast with each other. The French are at the present time adhering to a great extent to their old system of using coarse numbers and correspondingly coarse reeds, while the Germans have gradually adopted the practice of employing fine numbers of silk yarns. This difference is due in a great measure to the fact that the French manufacture a more expensive grade of goods, while German mills are unfortunately as yet confined to the medium and low price grades.

Within the past few years, however, fashion has changed somewhat, in favor of the lower and cheaper goods, such as are made in Germany, while the heavier and more expensive qualities have been neglected. We desire to call attention to the limits within which the fine and coarse numbers of yarn can be used. A large part of the fabrics on the market today are made with raw silk, and then dyed in the piece. Thrown silk (twisted Grege), such as is used in the manufacture of organzin, or tram, is made generally with two or three threads twisted together. The finest twisted Grege is between seven and eight deniers international standard. Organzin of 15 deniers can be produced with this fine Grege.

The finest number that can be used to advantage for weaving Grege is between nine and ten deniers, but as a rule nothing under twelve deniers is used, as manufacturers are opposed to using such fine yarn. They assert that the thread is so weak that it cannot stand the tension necessary for

weaving, which results in bad running warp and imperfect goods, while textures made with such fine yarn do not have a full, well covered face.

In reply to such objections, we would say that it is absolutely necessary when using such fine silks that the raw material be of the very best quality. This is especially true when the goods are woven on power looms. The failure of attempts to use such fine silks, is often attributed to other than the true cause which is that silk of the second or third grade was selected in order to save on the price. A great deal depends upon the proper selection of the Grege. There are many different kinds, such as Cevennes (French), Spanish, various grades from Asia Minor, Syria, Milan and Piedmont; also, Brussa Grege, and a large variety from China and Japan.

The Cevennes Greges are very well adapted for fancy articles, particularly jacquard work. They are very strong, and can be used even for the heaviest goods. The only drawback is, that they are somewhat rough, and, consequently, a very fine reed cannot be used. A 10-denier Cevennes Grege can be easily used for fabrics with taffeta or grain weaves.

In the manufacture of Rayes, made with a combination of satin and grain weave stripes, 10-denier Cevennes Grege can be used for the satin weave, while not finer than 12-denier yarn can be used for the grain weave. Grege of from nine to ten deniers will answer for jacquard fabrics with satin weave, and for such goods it is not necessary to use the expensive Cevennes Grege, good Milan Grege being all right for this purpose.

In this way, by using sizes from nine to eleven, instead of twelve to thirteen deniers, about 20 per cent. is saved in the cost of the raw material. This difference more than compensates for the slight inferiority of the face of the goods. The Japan Greges have many of the good qualities of the Cevennes grades. They are very strong, and after boiling out, show a high lustre, but should not be used with very fine reeds, owing to their roughness.

In China silks, only the China filatures are to be considered for weaving purposes. They produce an excellent material of fine quality. The kinds wound in China according to the domestic fashion, such as Tsatlees, Kahlings, Hangchow, Minchew and Shantung, cannot be used in European mills.

The use of Canton Greges has increased greatly during the past few years, a fact due chiefly to their low price, for while the North China filature costs at present from 48½ to 50 francs for from 10 to 12-denier yarn, the same Canton filature of the best quality, wound for European use, costs only 35 francs.

The inferior qualities of Canton silk can be bought for 33, or even 31, francs. The only drawback is that they are not so smooth as the North China goods. Their application for fancy goods, is, therefore, somewhat restricted, but for the cheaper, smooth fabrics, they can scarcely be replaced by any other material. They are best suited for piece dyed smooth satins and serges of a medium closeness of texture. The Brussa and Syria Greges are used to a very small extent in Germany, while large quantities of these grades are used in France.

Where silk is dyed in the skein, the answer to the question as to how fine a size can be used, depends greatly upon the fabrics that are to be made. By far the largest part of the sateens and serges are now dyed in the piece, and only the better qualities of smooth goods used for dress purposes, such as satin duchesse, or gentlemen's linings, woven with a serge or sateen weave, are made from silk colored in the skein.

Milan organzin works very well in size of 16 or 17 deniers, even when loaded 40 or 50 per cent. for deep black. It must be borne in mind that these fine grades should only be used in sateen or similar weaves. For taffeta, or grain weaves, 19-denier can

be the limit below which it would not be advisable to go.

The prejudice against anything but Milan organzin for these fabrics, which exists in Germany, is entirely unfounded. Japan organzin, if not twisted too soft, will give excellent results in these goods. The Lyons manufacturer has a great many more resources in selecting his raw silk than has the German. Brussa and Syria organzins are as yet only known by name in Germany, and yet Syria silk gives a good, full face and high lustre. On being dyed, the thread swells considerably, which gives a face equal to most other grades. The silk is naturally soft, and well adapted for lighter goods.

The Brussa silks are very strong, and can be used advantageously for heavy goods. They take the loading very easily, and in this latter respect give almost as good results as the Japan silks, which, as is well known, can be loaded better than any other grade.

DESIGN FOR SATIN OR MITCHELINE QUILT, BY T. HENDRY, PUBLIC DESIGNER.

POWER DEPARTMENT.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

ELECTRICITY—STEAM—WATER.

The Fan Factor in Steam Economy.

A. W. BAYARD.

(Continued from November.)

Mechanical induced draft consists in the application of fans between the boiler and the stack for the purpose of effecting a rapid movement of the gaseous products of combustion. By thus reducing the pressure in the smoke connections of the boiler, the effective draft pressure is increased, resulting in an increased supply of oxygen to the fuel. In other words, for the chimney is substituted a mechanical agent, at once vigorous, positive and flexible. Having seen how much more efficient than the chimney the fan is, it is only natural to expect a material saving by the use of the latter.

With a chimney the gases cannot be cooled below a certain point, which means unavoidable waste of heat in the shape of escaping hot gases. With a fan, however, the minimum temperature has no effect upon the draft, and hence a great deal of heat may be utilized by passing the gases through an economizer or other heat-abstracting device. By a proper application of an economizer and induced draft fans to a boiler plant, a saving of from ten to fifteen per cent. may readily be effected.

Turning to the furnace, it is found that the most important losses there are caused either by too little or too much air. Average coal requires for perfect combustion a theoretical air supply of about twelve times its own weight, but in practice it is found that, to provide for a certain amount of oxygen which escapes combustion utilization, a varying percentage of excess must be supplied.

If too little oxygen is furnished, the coal burns to carbonic oxide, and in doing so develops less than one-third as much heat as it would if it obtains enough air to burn to carbonic acid. Here then is an important source of loss from insufficient air.

On the other hand too much air is productive of loss. In general, the higher the furnace temperature the greater is its efficiency. If, now, a greater volume of air enters than is necessary the heat developed cannot raise the greater volume to as high a temperature, in addition to which the increased amount of moisture entering the air acts to decrease the temperature and heat-imparting power. This increased volume must also move at a greater velocity and consequently give up less heat. Hence too much air means loss all around.

Again, during the progress of combustion the hot gases in the furnace evolve finely divided particles of carbon; if oxygen is supplied to these while they are hot, they are burned, but if they are chilled below their temperature of ignition they pass off unburned as smoke. The panacea for all these ills is, of course a proper supply of air in which the excess is just that required for most efficient combustion, and this state of affairs can most readily be brought about by means of a fan. Induced draft acts to cause a more intimate commingling of the oxygen with the fuel, for it allows a thicker bed of coal and thus decreases the excess of air needed; it also increases the rapidity of combustion For these reasons the furnace temperature and hence its efficiency is increased with a proper proportioning of the heating surface.

Another advantage of no small importance accruing from the use of induced draft is the ability to make use

of low grades of fuel which could not otherwise be employed. In places where both anthracite and bituminous is available, a mixture of 75 per cent. of the former with 25 per cent. of the latter produces the best and hottest fire, with the practical elimination of the smoke nuisance, a matter of some weight within the limits of certain cities.

In addition to these points, mechanical induced draft provides for future increase of capacity. More steam at any time may be had by an extra turn of the fan engine throttle, and in this way also absolute independence of atmospheric conditions is secured.

Or, if desired, the boiler pressure may be maintained constant by an automatic device regulating the fan engine, so that a decreasing boiler pressure due to increased steam consumption or otherwise, causes the fan to speed up.

If now we add to the list of fan virtues already enumerated the further fact of low first cost, it must be admitted that the array is a convincing one. The cost of fans, engines, connections and short light stack represents but a small fraction of the outlay necessary for a chimney. For a foundation, fans need little or nothing; in fact, they can be placed above the boiler floor level and ground space thus economized. In addition to low, first cost, the maintenance cost is low, and, in fact, if the fan engine exhaust is utilized for heating or other purposes, as will usually be the case, this expense becomes almost nothing.

The third of the accompanying cuts shows a very convenient type of induced draft apparatus. Two Buffalo fans are placed side by side with a

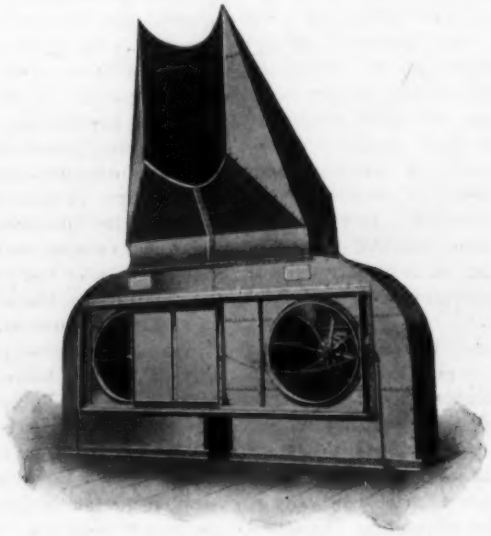


FIG. 3.

sliding damper between. They are driven by two Buffalo upright enclosed engines, and have overhung fan wheels and water-cooled bearings.

The gaseous products of combustion enter the fans in a direction parallel to their axes, and are discharged radially from the blade tips upward through the sheet iron connection leading to a short light stack. The fourth cut shows the application of a slightly different construction of induced draft apparatus to a battery of boilers with economizer and automatic stokers. With the latter system mechanical

draft goes hand in hand. The plant shown here is typical of advanced ideas in boiler practice.

We wish to record our acknowledgment to the Buffalo Forge Company, of Buffalo, N. Y., mechanical draft experts, from whose installations these cuts have been obtained.

The Power in a Pound of Coal.

Let us take a pound of what we will call average coal, containing, say, 10,000 heat units. This would be somewhat smaller in size than a man's fist. A pound of this coal, if expended in mechanical work, would give 236-h.p. Imagine at the time of the Pharaohs two long lines of men, extending over half a mile, all pulling steadily, at the command of the taskmaster, at a great rope to raise some huge obelisk, and, as you see them sweating, tugging and straining, think again of this small lump of coal in which nature has placed an equal amount of power. In some countries men who have been specially trained as porters to carry heavy loads on their backs, will, as a full day's work, carry a total of from 350 to 600 pounds a distance of one mile. And yet each has expended but one-third of the power stored up in the pound of coal.

An exceptionally strong man has been known to do one-half horsepower of work as his mightiest effort; but in two and a half minutes' work at this rate exhausts his muscular force. Let us suppose one hundred men putting forth such extreme effort at rope, or crank, or crowbar; as they fall back, red-faced and puffing to catch their breaths, we might imagine this little black lump saying to them: "I can do as much as your whole company and then can stand it for fully two minutes longer before I am exhausted!"

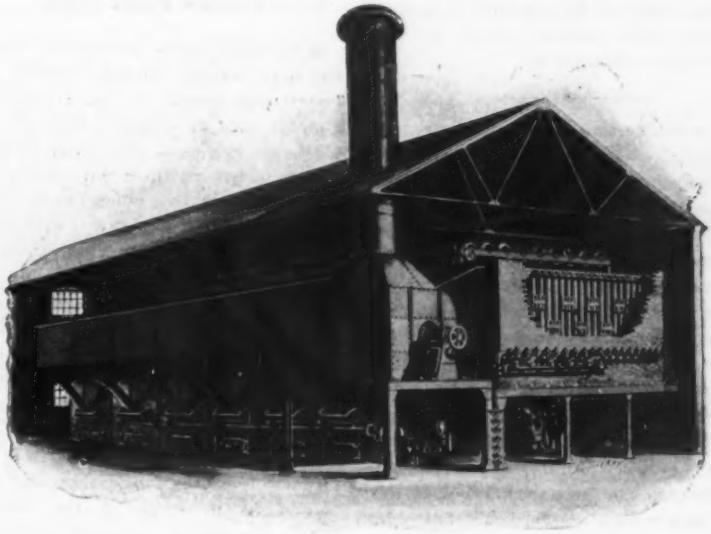


FIG. 4.

Let us now turn to another portion of the human race. From the earliest times spinning has been a much-prized accomplishment of the fair sex. We need look back to our own grandmothers. We can picture them, from their own stories told us when we were children, as rosy-cheeked damsels sitting around the open fireplace and spinning from early candlelight till bed time, let us say possibly two hours. Let us then consider for a

moment the thousands of spindles rattling and whirling in a modern cotton factory, impelled by the power locked up in coal. One pound of this coal carries the potential energy to do the work of three thousand such spinsters.

In sawing wood, a man may work at the rate of about 60 strokes a minute and consider himself a "top sawyer," and his saw blade may have progressed five feet a minute; but a circular saw, driven by machinery, may be put through 70 times that distance and saw 70 times as much wood. And yet this one little pound of coal contains power enough for 190 such saws.—Kuhlow's.

Mechanical Draft.

Messrs. Mills and Rowan, in their exhaustive work on Chemical Technology, make the following pertinent statements regarding the subject of Mechanical Draft. The principles of what is now becoming well known under the name of forced combustion have been repeatedly advocated during past years by those who have devoted thought and study to the subject. The position assumed by them—which is now finding favor amongst engineers—has been, in brief, that the air supply required for combustion in furnaces can be more economically furnished by mechanical power than by the action of chimneys; and that the mechanical method has other advantages, which enable it to be preferred to the one which is older, but more imperfect. One of these advantages is the higher temperature of combustion, which is equivalent, with a boiler of good design, to an increased evaporative power of the boiler, or to increased evaporative effect for the fuel. Another advantage, which has not been fully realized in any plan as yet introduced in practical work, is that the rate of travel and escape of flame and hot products of combustion is under control. It is thus possible to cool them more completely than can be done when chimney draft is used, and this means a saving of heat which would otherwise be uselessly dissipated.

Mechanical or artificial draft thus presents to us a method of economically furnishing the air supply to furnaces and producing a more efficient combustion temperature, while it also renders possible further economies due to retarding the movement and escape of hot gases, and to preliminary heating of the air supply by waste heat or otherwise.

The Mill Power Plant.

Every mill owner knows how essential it is to keep the mill running. An hour's stop means far more than the amount paid in wages. Still in factories of any size, this item of five, ten, or thirty minutes cuts down the profits, especially when such close margins as the last few years have allowed the "Office." Then knowing that stoppage means loss, why not have a look at what keeps the wheels revolving, namely the engine room?

No doubt there are many who still think they know nearly all there is to be known about the motive power of a mill. Our advice applies to just their case. Take a look around. Now let us start from the foundation, and this brings us in front of the boilers. While we do not advocate paying a fireman a cent more than he is worth, still there are both good and bad ones, and one who looks oftener to his employer's interest than at the clock, and knows how to save coal, is the cheapest man for the fire-room. Take a look in there, say some Friday about 4 p. m. He may be on the chair or not, (the chair is the better place for his employer, all points considered), for when the fireman is active the "black diamonds" are vanishing, and he can fire his wages through the furnace door, using strength, ignorance and a slasher.

It will be impossible for the writer to give a set of rules to fire a string of boilers economically, as no two re-

quire the same treatment, some light, others heavy as the draught calls for. Still, it is safe to say in four out of five cases we fire too heavy. Of course this is very indefinite, but right here comes in the employer's interest, and if the man with the shovel works for him, and not simply to draw his week's pay, he will find out where the economical point to fire is.

As a short illustration of what strength can accomplish: The writer was called upon to overhaul a small twenty-five h. p. engine and boiler. It would not steam. It was used as a pumping station upright boiler, with a new common D valve engine, using No. 1 soft coal. The engineer holds a Mass. engineer's license. Roof of building three feet above boiler; could not clean the flues. In fact they had never been cleaned until we did it. The lever safety valve had the weight at "clear out," and four large bricks were added to this weight.

We found the pressure required to do the work, and have "governor" handle the same, was sixty-five lbs. They were using ninety-five lbs. Question: Did the boiler evaporate more water at 95 than 65? We are inclined to "doubt it."

The writer was given this position with a few doubts in his employer's mind as to ability. We removed the bricks on our own responsibility. He missed them, but after the scouring we gave the flues and he still had the engine up to the required speed, we were saved. We suggested an outlay of seventy-five dollars for a pump to take the place of inspirator, raising the roof so as to be able to clean the flues, and covering boiler, and agreed to give the amount back in three months time in coal. But we had tempted fortune to the limits. He consulted home talent and we were lost.

Now we do not wish to convey the impression to our readers that an inspirator is of no use in a mill; far from it. They are all right in their place, but we do not think that place is feeding a boiler, using a non-condensing engine. In its place use a good heater and pump; have an inspirator attached if you wish. They are very handy, but the pump is the main stay.

Engine repairs, as a rule, should be done by the firm building the same. For reboring cylinders, the repair shops of mills generally do not own the tools to do the job, and a good man knowing just what he is doing is needed to do the trick; keeping all the alignments true, giving a good, smooth bore and perfectly straight; using no more stock than is actually necessary.

REPAIR.

In a Master Mechanic's Day's Work.

No. 1.

REPAIRS TO FEED PUMP VALVES.

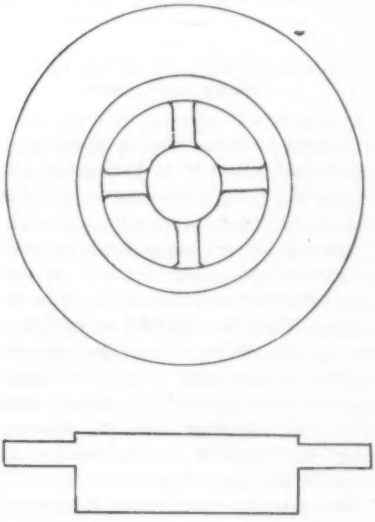
It sometimes happens that the seat of a valve on a boiler feed pump gets loose, and before it is noticed or attended to, in an extreme case may practically have destroyed the thread of the hole in the pump framing into which the valve seat screws. When an accident of this nature happens to a pump it can be repaired by reaming out the hole in the pump frame and tapping it out with a suitable sized tap. A valve seat of the correct size to fit the hole must then be ordered from the builders of the pump or made in the mill shop.

This method of repairing the pump is the natural one to follow provided there is a tap of the required size in the shop, or that one can be borrowed to do the job with; but when one hasn't the required tap, and is not able to borrow one, it is well to think over the matter in order to see if the work can not be done in some way or another without the use of the tap, because to buy a large tap such as would be required for this job means the spending of a good many dollars for a tool that may not be used once in several years.

There are at least two other ways in this case by which the needed repairs can be made:—the hole in the pump framing can be reamed out with a

slight taper to it, and a valve seat made and turned up with a taper to fit the hole, then the seat driven home into the hole, and finally a hole can be drilled obliquely through the framing into the seat into which a pin must be driven in order to prevent the seat from working loose under the continuous pounding of the valve.

The other way to do this job is to have a suitable valve seat cast and finished up. The drawing shows the shape and size of a seat that was used on a job of this kind, and answered the purpose perfectly. A pattern is made from this drawing and a seat



cast from it at the nearest brass foundry. When the seat is received it will be necessary to face off the valve, seat proper, turn off the hub, say in this case to a diameter of three inches, face off the under side of the flange, and drill four seven-sixteenth holes, equally spaced around the flange, for the set screws, and drill out and tap a hole in the centre of the seat for the valve spindle. These set screws are to hold the seat in its place, and if at any time it becomes necessary to replace the seat it is a very easy matter to take out these set screws, remove the seat and replace it with a new one.

When the seat is all ready to go in, the pump will have to be opened up, the seat slipped into place and the holes marked, then take the seat out and drill the four holes in the pump framing and tap them out for say three eight set screws, then before putting the seat into its place cut a gasket out of sheet packing, the same size as the flange, slip it on around the hub so that the packing will come between the flange and the pump framing in order to make a tight joint; when this is all ready, put the seat in place and screw the set screws up solid and you have a good permanent job and one that is easy to repair should it ever require it.

In deciding which of these two methods to use in a case of this kind, one will be influenced by their own opinion and the circumstances and conditions under which they are working. Either way is good and will make a first class job.

In getting a seat cast, try and get it as tough and hard as possible, hard in order to prevent it grooving out too easily, and tough in order to keep the bars from cracking. In the past twelve months we have had several new seats that we put in one of the pumps broken in service; this was caused by the metal being too brittle to stand the constant pounding that it is subjected to while the pump is in service. These seats came from the builders of the pump, consequently one would be pretty sure that they would be all right; but their breaking in the way they did, shows that even the special mixing that the manufacturers use is apt to get a little "off colour" sometimes in spite of the great care that they undoubtedly use.

MECHANIC.

(To be continued.)

--The awarding of prizes at the Paris Exposition has aroused a storm of protests from all parts of France. It is claimed that undue favor was shown to the foreign exhibitors, particularly in the knit goods department.

DYEING DEPARTMENT

Dye Recipes for December.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16 page pamphlet, in convenient form for preservation. Subscription price for the TEXTILE WORLD with the Dyers' Supplement is $4.

The TEXTILE WORLD asks practical men to contribute articles for this department. We pay for articles accepted. The acceptance depends entirely upon the value of the ideas expressed. We make all necessary revisions, and urge practical men to contribute, regardless of experience in writing for publication. Illustrations add much to the value of an article, and photographs and sketches are desirable. All communications are confidential, and under no consideration is writer's name published or made known without his permission.

Recipe No. 177.

Brown on Cotton Yarn.

Immedial Brown B Pat. on 100 pounds of cotton yarn.

Prepare the dye bath with

15 lbs. Immedial Brown B.

(Wm. J. Matheson & Co., Ltd., 182 Front St., New York.)

15 lbs. Soda Ash.

8 lbs. Sulphide of Soda.

100 lbs. Common Salt.

Dye one hour in a fairly short bath at 180° F., keeping the yarn well below the surface of the liquor.

Immedial Brown B like the Immedial Blacks produces shades excellently fast to washing, light, acids, etc. An after treatment with copper sulphate and bichromate of potash intensifies the shade and increases the fastness. (See Recipe No. 298.)

Recipe No. 178.

Yellow on Cotton Yarn.

Diphenyl Yellow 3 G on 100 pounds cotton yarn.

Prepare the dye bath with

½ lb. Diphenyl Yellow 3 G.

(John J. Keller & Co., 104-106 Murray St., New York.)

20 lbs. Common Salt.

Enter yarn at 170° F., bring to a boil, and dye at this temperature for one hour.

Diphenyl Yellow 3 G is recommended for its level dyeing properties, and can be used advantageously in all combinations where a bright full boiled yellow is required. The shades produced stand the light, washing and hot pressing test exceedingly well, which makes the dyestuff a valuable one.

Recipe No. 179.

Blue on Cotton Yarn.

Tetrazo Blue 6 B on 100 pounds of cotton yarn.

1 lb. Tetrazo Blue 6 B.

(New York & Boston Dyewood Co., 55 Beekman St., New York.)

20 lbs. Sodium Sulphate.

1 lb. Soda Ash.

Enter yarn at 180° F., bring to a boil and dye at this temperature one hour, allowing to steep in the cooling bath one fourth hour.

Tetrazo Blue 6 B is one of a new set of direct cotton colors, recently introduced by the N. Y. and Boston Dyewood Co. They possess extreme clearness of color, and also all the other valuable properties of the direct cotton colors.

Recipe No. 180.

Bordeaux Red on Cotton Yarn.

Bordeaux Red 6 B on 100 pounds of cotton yarn.

Prepare the dye bath with

1 lb. Bordeaux Red 6 B.

(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)

10 lbs. Glauber's Salt.

¾ lb. Soda.

Enter yarn at 170°, bring to a boil, and dye at this temperature one hour.

Bordeaux Red 6 B is a direct cotton color, and is remarkable for the clear

shades it produces. It possesses all the characteristic properties of the direct cotton colors.

Recipe No. 181.

Brown on Cotton Yarn.

Immedial Brown B (pat.) on 100 pounds of cotton yarn.

Prepare the dye bath with

15 lbs. Immedial Brown B.
(Wm. J. Matheson & Co., Ltd., 182 Front St., New York.)
15 lbs. Soda Ash.
8 lbs. Sulphide of Soda.
100 lbs. Common Salt.

Dye one hour in a fairly short bath at 180° F., keeping the yarn well below the surface of the liquor.

After dyeing, wash, and after treat for ½ hour at 180° F. with

1½ lbs. Bichromate of Potash.
1½ lbs. Copper Sulphate.
2 lbs. Acetic Acid.

This dyestuff, like the Immedial Blacks, produces shades excellently fast to washing, light, acids, etc. An after treatment with bichromate of potash and copper sulphate intensifies the shade and increases the fastness. (See 297 for the untreated sample.)

Recipe No. 182.

Yellow on Cotton Yarn.

Diphenyl Yellow 3 G on 100 pounds of cotton yarn.

Prepare the dye bath with

1 lb. Diphenyl Yellow 3 G.
(John J. Keller & Co., 104-106 Murray St., New York.)
20 lbs. Common Salt.

Enter yarn at 170° F., bring to a boil and dye at this temperature for one hour.

Diphenyl Yellow 3 G is recommended for its level dyeing properties, and can be used advantageously in all combinations where a bright full yellow is required. The shades produced stand the light, washing and hot pressing test exceedingly well, which makes the dyestuff a valuable one.

Recipe No. 183.

Blue on Cotton Yarn.

Tetrazo Blue 3 B on 100 pounds of cotton yarn.

Prepare the dye bath with

3 lbs. Tetrazo Blue 3 B.
(New York & Boston Dyewood Co., 55 Beekman St., New York.)
25 lbs. Na_2SO_4.
1 lb. Soda Ash.

Enter material at 180°, bring to a boil and dye at this temperature one hour, allowing to steep in the cooling dye bath one-fourth hour.

Tetrazo Blue 3 B is one of a new set of direct cotton colors, recently introduced by the N. Y. & Boston Dyewood Co. They possess extreme clearness of color, and also all the other valuable properties of the direct cotton colors.

Recipe No. 184.

Indigo Blue on Cotton Yarn.

Direct Blue 3 B B on 100 pounds cotton yarn.

Prepare the dye bath with

3 lbs. Direct Blue 3 B B.
(O. S. Janney & Co., 8-10 Letitia St., Philadelphia, Pa.)
20 lbs. Common Salt.

Enter the cotton at 160° F., turn while raising to the boil, and continue the boiling for one hour, wash and dry.

The dyestuff is not exhausted and subsequent lots require about ⅛ less dyestuff.

Direct Blue 3 B B is quite fast to light and washing, and possesses great brilliancy and purity of shade.

The shade can be made considerable faster by subsequent treatment with bluestone, which makes it duller and somewhat greener.

Recipe No. 185.

Red on Worsted Yarn.

Amaranth No. 314 on 100 pounds of worsted yarn.

Prepare the dye bath with

2 lbs. Amaranth No. 314.
(Schoellkopf, Hartford & Hanna Co., 100 William St., New York.)
10 lbs. Sodium Sulphate.
4 lbs. Sulphuric Acid.

Enter the yarn at 170° F., bring to a boil and dye at this temperature for

at least one hour, exhausting the bath if possible.

Amaranth No. 314 is a brilliant acid dyestuff, possessing a high coloring power.

Recipe No. 186.

Blue on Cotton Yarn.

Direct Navy Blue S W on 100 pounds of cotton yarn.

Prepare dye bath with

5 lbs. Direct Navy Blue S W.

(Anchor Color Manufacturing Co., 462 Cherry St., New York.)

25 lbs. Common Salt.

Enter yarn at 140° F., bring slowly to a boil, and dye at this temperature for one hour.

Direct Navy Blue S W produces a deep shade of blue on cotton yarn, and possesses all the characteristic properties of the direct cotton colors. Direct Navy Blue S W may also be used in the dyeing of cotton and wool union goods.

Recipe No. 187.

Violet on Worsted Yarn.

Acid Violet 8 B on 100 pounds of worsted yarn.

Prepare the dye bath with

1 lb. Acid Violet 8 B.

(A. Klipstein & Co., 122 Pearl St., New York.)

having the bath neutral.

Enter the yarn at 120° F., bring slowly to a boil, and dye at this temperature for one hour. Add the dyestuff in portions, but below 180° F., and toward the end of the dyeing add 1 per cent. of acetic acid to brighten.

Acid Violet 8 B. is recommended for its pure and bluish shade of violet, and its high coloring power, at an exceedingly low cost.

Recipe No. 188.

Orange on Cotton Yarn.

Direct Orange T G on 100 lbs. cotton yarn.

Prepare the dye bath with

1 lb. Direct Orange T G.

(C. Bischoff & Co., 87-89 Park Place, New York.)

15 lbs. Common Salt.

Enter yarn at 170° F., bring to a boil, and dye at this temperature one hour.

Direct Orange T G has exceptional tinctorial power, and requires only 1 per cent. to produce a full shade of orange. It possesses all the valuable properties of the direct cotton colors.

Recipe No. 189.

Green on Cotton Yarn.

Columbia Green on 100 lbs. of cotton yarn.

Prepare the dye bath with

3 lbs. of Columbia Green.

(Berlin Aniline Works, 72 Front St., New York.)

20 lbs. of Common Salt.

Enter yarn at 180° F., bring to a boil, and dye at this temperature for one hour.

Columbia Green has excellent penetrating and coloring power, and possesses all the valuable properties of the direct cotton colors.

Recipe No. 190.

Yellow on Cotton Yarn.

Alizarine Yellow D R on 100 lbs. cotton yarn.

Prepare dye bath with

3 lbs. Alizarine Yellow D R.

(Victor Koechl & Co., 122 Hudson St., New York.)

20 lbs. Common Salt.

Enter yarn at about 160° F., work while bringing to a boil, and continue the boiling for one hour.

The bath is not exhausted, and for subsequent dyeings the percentage may be decreased ⅛.

Alizarine Yellow D R has a high tinctorial power, and produces a brilliant golden yellow shade, with very good fastness.

Recipe No. 191.

Black on Cotton Yarn.

St. Denis Black B on 100 lbs. of cotton yarn.

Prepare the dye bath as follows:

To kettle containing 300 gallons of water, add

For starting bath—

30-35 lbs. St. Denis Black B.

(The St. Denis Dyestuff & Chemical Co., Sykes & Street, 85 Water St., New York, sole U. S. agts.)

300 lbs. Common Salt.

For second bath—

20-25 lbs. St. Denis Black B.

100 lbs. Common Salt.

For third and following baths—

15-18 lbs. St. Denis Black B.

50 lbs. Common Salt.

Enter the previously wet out yarn, and dye at a boil for one hour. Lift, allow to drain, wash well, and fix in a bath made up as follows:

6-10 lbs. Copper Sulphate.

10 lbs. Common Salt.

Enter the yarn into this bath at 110°-120° F., and work one-half hour, raising the temperature meanwhile to 160° F. to 175° F., according to the shade desired. (The higher the temperature the redder the shade.)

Soaping produces brighter and bluer shades.

The dye kettles must be of wood or iron.

St. Denis Black B belongs to the sulphur group of coloring matters, to which Cachou de Laval and the Thiocatechines belong, and is a distinct improvement on the former standard Vidal Blacks.

It dissolves readily without the use of sodium sulphide, goes on the fibre evenly, and is remarkably fast to light and washing.

Recipe No. 192.

Orange on Cotton Yarn.

Direct Orange T R on 100 lbs. of cotton yarn.

Prepare the dye bath with

1 lb. Direct Orange T R.

(C. Bischoff & Co., 87-89 Park Place, New York.)

15 lbs. Common Salt.

Enter yarn at 170° F., bring to a boil, and dye at this temperature one hour.

Direct Orange T R has exceptional tinctorial power and requires only 1 per cent. to produce a full shade of orange. It possesses all the valuable properties of the direct cotton colors.

A Curious Cause for Yellowish-Green Spots in Black Piece Dyed Goods.

FROM THE EXPERIENCE OF A DYER.

Yellowish spots in black piece dyes can arise from various causes. I have known of their being caused by card wire getting into the yarn. The wire became wet in the weaving and fulling processes, and the rust from the wire caused spots on the fibre. The wire itself, however, was shaken out of the cloth in the gigging, and this made it very difficult to discover the cause of the spots.

At another time small oil spots appeared on the goods, caused no one knew how. Oil dropping on the cloth often contains a small quantity of iron, causing bad spots in the goods, which cannot be entirely removed, while they easily escape notice in the white goods.

But I wish to speak now of yellowish-green spots that at one time appeared in black piece dyes, and could not be removed by any known means. Not the slightest trace of them appeared in the goods before dyeing; from this, it was assumed that the spots were caused in the dyeing process. They were scattered through the cloth, and had the shade of the prepared goods.

It was imagined that they were caused by resin or gum which had got into the cloth in the course of manufacture, but this seemed improbable. This suspicion, however, was completely verified. The tartar used in dyeing the goods had been packed in barrels that had previously contained resin, and small particles of this resin became mixed with the tartar. Not one dyer had thought of this cause, although his work is threatened with dangers from all sides. Spots caused in this way are not susceptible to the action of boiling or of the logwood, and preserve the appearance of the undyed cloth.

After the discovery of the cause, the tartar was first dissolved in cold water and filtered before using, which remedied the trouble completely.—Farber Zeitung.

Notes on Dyes and Dyeing.

From our English Correspondent.

The year now drawing to a close has been one of remarkable activity in the production of new Aniline dyestuffs and improved methods of dyeing. The number of new colors, especially of the direct or substantive series that have been put upon the market, is almost bewildering. A practical dyer could not be expected to keep pace with them; and the majority of these dyestuffs have each so many excellent properties, though varying in degree of fastness and special adaptability for different fibres etc., renders a full appreciation of them all still more difficult.

There is, no doubt, a good deal of repetition in different named colors of different makers, colors having similar properties as regards shade and degrees of fastness; but that is the inevitable result of the great activity of the color-chemists.

A well known dyer complained that the extreme simplicity of the application of non-mordant colors had bred a certain amount of carelessness among young dyers who considered a short apprenticeship sufficient to enable them to aspire to being boss dyers. Perhaps the spread of education and the increasing number of our technical schools have tended to this. Yet how different now is the routine of the dyehouse to that of the olden times, and yet how recent it is since the first of the direct dyeing series of Anilines was introduced.

The last twelve months have produced an extraordinary increase in direct cotton and union blacks. The Logwood industry has in these products most formidable opponents. Cassella & Co. may be said to have been the most active in their attack upon that useful but ancient coloring matter. The recognition by cotton dyers of the undoubted advantages of Diamine Black, diazotized and developed, was the first distinct success in this department of dyeing. These blacks, besides yielding excellent shades, leave the fibre softer to handle than Logwood, Aniline Blacks (Aniline bil process) have the inevitable tendency of turning green sooner or later, besides being costlier. All cotton thread manufacturers have adopted Diamine Black or similar colors. Also, Cassella's Oxydiamine Blacks led the way with non-developed blacks. And now the Sulphur group of coloring matters (The St. Denis Dyestuff and Chemical Co.) of which Chachou de Laval and Thiocatechines form a part, are represented by the improved qualities of St. Denis Black V, that is remarkably fast to acids, light, milling and cross dyeing.

As regards wool dyeing, the first most effective opponent to Logwood (following on Naphthol Black) was Cassella's Naphthylamine Black H B. But in this connection we have an illustration of how an artificial coloring matter proves only by time its proper position as a satisfactory substitute for a natural product of long standing. The hosiery manufacturers of Leicester and Nottingham adopted that black (and similar wool blacks) very considerably two years ago, but today the majority have discarded them entirely and returned to Logwood. These hosiery dyers were met with increasing complaints that the wool was not of the same body as formerly, and had a "thin handle." Nor could the dyers return their work with the added weight that could be managed with Logwood. Then among the felt hat dyers of Stockport, Denton & Hyde, Logwood is almost entirely superseded by that excellent wool black of Bayer's Diamond Black.

The substantive colors have found an increased use in the dyeing of mercerized cotton for which they are well suited.

One of the most suitable colors for mercerized yarn is Dianthine 4 B of Brooke, Simpson & Spillers, Ltd., a

brilliant scarlet that necessarily works with Caustic Soda; but, unfortunately it is not adapted for mixed goods of cotton and wool. Nor can Dianthine be used in mechanical cop dyeing with success, nor, of course, the mercerizing in the cop. Yet a patent was taken out in France last year for the mercerization of separate threads before weaving. The object was to get rid of the stretching, and it was to be attained by preventing the contracting by mercerizing it while it was being wound on the reel. But the inventors do not explain the difference between tension which prevents contraction and tension which brings it back to the original size. Much remains to be learned regarding the dyeing of mercerized goods. The commercial use of the process is comparatively recent. A gauge of the popularity of a new textile material, such as mercerized cotton, may be taken when such goods begin to arrive at the dyers and cleansers. So said one of the largest London cleansers, who only finds now, after the lapse of say two years, any bulk orders reaching him.

The dyeing of tin-weighted silk has not made much advance in England yet. Only about two dyers in the Macclesfield district have taken the subject up seriously. Opinions differ as to the most suitable class of Aniline colors for heavily tin-weighted silk, but I find the basic coloring matters give the best results. Pure phosphine, for instance, is excellent for creams and yellows, being a basic color, but some acid colors are also very satisfactory.

Considering the enormous amount of manufactured silk goods imported into England, manufacturers are eager to adopt the latest Crefeld weighting dodges. Sir Thomas Wardle, of Leek, a large silk dyer, and an undoubted authority upon the subject, has fought strenuously against the process, but has had to succumb to the exigencies of trade.

But, we must remember that the first sinner was the silk worm itself, that charges its silken fibre with at least 25 per cent. of weighting material in the form of gum. But the instinctive object of the worm is to protect the fibre from climatic and other dangers, not to deceive the unwary buyer. The undoubted effect of excessive weighting is the rotting of the material within at least 12 months time.

The boom in combines among the English textile manufacturers and dyers is perhaps the most prominent feature in the past year's trade record. The Calico Printers' Association has not made a good start, but no doubt the difficulties attending the organization of so many large businesses have been very great. These drawbacks have no doubt been further aggravated by the unprecedented rise in the price of coal, the dearness of American cotton, the troubles in China and the Indian famine. Whether the conditions of our free trade system are conducive to the ultimate success of these combinations is open to question. A few years ago it would have been considered impossible here. This has no doubt saved many printers from speedy collapse.

The Aniline dealers and drysalters have been sorely hit, and even the Aniline manufacturers, of which there are six in England, have had to accept ruinous prices in order to "keep in." A combine among these Aniline manufacturers, and those of the Continent, would be the natural corollary to all this: but, in England we are swamped by our Teutonic friends, and there are too many "free lancers" who find in England a conveniently open door, to make such a proposition feasible.

Alizarine will no doubt permanently rise in price by the combined action of the two English, and the German manufacturers.

According to Board of Trade returns our general trade is, at first glance, flourishing, but if we compare with these the still greater increase recorded in Germany and America, the consoling effect is greatly minimized.

The German Dyestuff Industry.

The manufacture of dyestuff is undoubtedly one of the great industries of Germany. In spite of the increasing competition, and the increase of cost of production, these industries have been exceedingly prosperous. The dividends paid by the leading firms in this industry, for the past three years, are as follows:

	% 1899	% 1898	% 1897	Capital Stock. *Marks.*
Badische Anilin- und Sodafabrik	24	24	24	19,800,000
Farbw. vorm. Meister Lucius & Bruning .	26	26	26	17,000,000
Farbenfabriken vorm. Friedr. Bayer & Co.	18	18	18	12,000,000
Actien-Ges. f. Anilinfabrikation, Berlin .	15	15	12½	7,000,000
Ver. Ultramarinfabr. vormals Leverkus, Zeitner & Cons. . .	5	5	5	5,500,000
Farbwerke Muhlheim vormals A. Leonhardt & Co.	5	3	9	2,100,000

The largest companies show the most favorable results. The increase in the manufacture of coal tar dyes has been truly gigantic, while the manufacture of mineral dyestuffs, during recent years, have not shown the same increase. Die Actien Gesellschaft fur Aniline Fabrikation has increased its capital 2,000,000 marks during the last year, and made extensive additions to the plant. This company has also established the Berlin Aniline Works, in America, to sell their product in the United States.

The Badische Aniline Soda Fabrik has found such a wide market for their artificial indigo that this product has become a very formidable competitor of the natural dye. Die Hochster Farbwerke vorm. Meister Lucius & Bruning have during the last year converted their Moscow branch into a stock company, whose entire capital is owned by the parent concern.

The Farbenfabriken vorm. Fredr. Bayer & Co. was established in 1881, for the manufacture of dyestuffs, absorbing the plants at Elberfeld and Barmen, and the branch establishments at Moscow, Schelploh, and Flers, near Roubaix. The Alizarinefarbriken of Dr. Leverkus & Sons was organized in 1891.

Dangers of Picric Acid.

A report to the British Home Secretary on the explosion at the picric acid factory of Messrs. Read, Holliday & Sons, at Huddersfield, on May 30th, states that picric acid, of which 10,000 lbs. was in the factory at the time of the explosion, was manufactured for dyeing purposes for over a century without its explosive properties being known, whereas it is now known to be more powerful than dynamite.

Hitherto, however, it has remained in doubt whether the acid could explode of itself under the influence of heat, or needed some chemical or detonating agent. Although the acid does not explode of itself, it forms very dangerous compounds with lime, iron, lead, and other substances.

In the present case the inspector holds it beyond doubt that the cause of the fire which first occurred was picrate of iron formed on a steam pipe, and exploded by a chisel used by a workman. The subsequent explosion was due either to the great heat developed by the fire in the dry picric acid, or to the formation of picrate of lime when the roof fell in upon the molten acid.

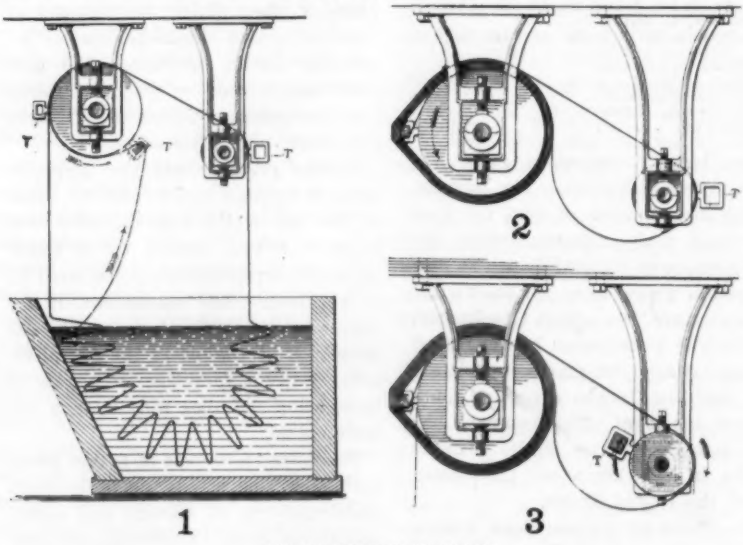
The facts show that in future picric acid should be placed under the same restrictions as to storage and manufacture as other explosives, and suggests a number of temporary regulations for the safety of the manufacture.

Piece Dyeing Machine.

When coloring goods in the piece, it is frequently necessary to add dyestuff to bring the color to sample, or with some colors it becomes necessary to add chemicals, in order to complete the process. These additions to the dye liquor can in some cases safely be made without removing the goods. The chemicals to be added are dissolved and then added carefully to the liquor, while the goods are being circulated in the tub; this method is al-

ways attended with more or less danger of causing cloudy or streaky goods, owing to the dye going on to the cloth unevenly, and in many cases it is found impossible to make the additions to the dye liquor without removing the goods, adding to the dye at a lower temperature, the goods are put back and the dyeing process completed. The difficulties attending this method are numerous, and various methods have been tried to conduct this operation quickly and without injury to the goods.

A U. S. patent has recently been granted for a device to roll the goods on the reel and unroll them quickly back into the liquor. The illustration shows the dye tub fitted with this device. The goods are run over a large reel and small carrying roll, in the usual manner, as shown in Fig. 1. At each end of these rolls a casting (T) is fitted, having an opening to receive a suitable wooden rod.



PIECE DYEING MACHINE.

These castings revolve with the roll, and when it becomes necessary to take the goods out of the liquor, the wooden rod is inserted in these castings on the large reel outside of the cloth. The reel is then reversed, and the dotted lines represent the position of the casting, rod and cloth just after this reversal has been made. The rod, as it reverses, catches the cloth and pulls it out of the liquor, and as the revolutions are continued, winds the piece on the reel, both from the front of the tub and from the rear.

Fig. 2 represents the whole piece wound on the reel; when the necessary additions have been made to the dye liquor, the wooden rod is introduced into the casting on the small roll, as represented in Fig. 3, and power is applied to this roll to revolve it in the direction of the arrow. At each revolution a portion of the cloth is unwound from the large reel by this rod on the small roll, and the cloth falls back into the kettle by its own weight. When the whole piece has been unwound, the rods are taken out of the casting, and the dyeing operation completed.

For the operation of this device, it is necessary to have power connected separately to each roll, in such a way that the large one can be revolved positively in each direction, and the smaller one revolved positively in the direction indicated by the arrow, and arrangements must be made by which the power can be disconnected from either one, so that they will revolve freely in their bearings.

QUESTIONS AND ANSWERS

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Extracting Hosiery.

Editor Textile World:

We are desirous of obtaining information on the subject of extracting hosiery. Any favors shown us will be appreciated.

Extract (29).

This is one of many inquiries that we have received asking for information on the same subject, and as space would not permit of our replying in the Questions and Answers Department, we publish in another part of this issue an article on extracting hosiery, by a well known chemist and dyer, which will give valuable information to all interested in the subject.

Mattress Shoddy.

Editor Textile World:

I would like to obtain the following information regarding mattress shoddy. Are the rags sprinkled with oil before running them to the picker, and if so, in what quantity, and how should it be applied? I would also like to know what kind of oil is used, the cost of same, and where it can be obtained?

Mattress (33).

The stock for stuffing mattresses, such as shoddy, flocks, etc., should be free from oil, as any oil in the stock is apt to work out and spoil the mattress, besides giving out a disagreeable odor.

Face Cloths.

Editor Textile World:

We would like to know the manufacturers or selling agents of the union face cloths illustrated and described in the November number.

F. C. (37).

We have replied by mail.

Ramie.

Editor Textile World:

Will you kindly inform us where we can purchase Ramie in large quantities?

Ramie (36).

We have answered this communication by mail, informing our correspondent where he can buy Ramie noils, 3 to 6 inches long, suitable for spinning on worsted machinery.

Stamping Machines for Hosiery.

Editor Textile World:

Please put us in communication with a firm selling machines for stamping figures, polka-dots, etc., on stockings.

Hosiery (30).

We have answered by mail.

Books on Textile Calculations.

Editor Textile World:

Will you kindly refer me to some treatise on the calculations of cost, weights, etc., of textile fabrics.

Book (32).

We would refer our correspondent to Textile Calculations, by E. A. Posselt, price $2; Calculations in Yarns and Fabrics, by Fred Bradbury, price $1. These books go very extensively into the subjects of calculation for textile fabrics, and also treat incidentally on calculation of cost. We can furnish either of these books. In the January and February issues of the Textile World, appeared articles on calculating the cost of textiles, which we think might be of value to you.

Working Cotton Waste.

Editor Textile World:

Can you give me any information as to a publication that treats on the processes of converting cotton waste into yarns for textiles?

Waste (31).

Regarding a publication on the manufacture of cotton waste, we do not know of any such work, and doubt if one has ever been written. Cotton waste, we believe, is manufactured into yarn by the regular woolen system, and the cards and mules adapted to the working of low woolen stock are found to answer very well with slight changes for the carding and spinning of cotton waste.

Chambray.

Editor Textile World:

Will you inform me what the manufacturer gets for chambray like the sample enclosed, which is all cotton, and what the yarn would cost. The warp is No. 34, and the filling is No. 56, both single yarn.

Blue (35).

We sent our correspondent a sample which is perhaps slightly heavier than his, which is sold at nine cents per yard, 5 per cent. and 5 per cent. discount. Regarding the cost of the yarn, it is rather difficult to quote prices at present, owing to the condition of the cotton yarn market, but we should say that the sizes mentioned could be purchased for about 20 or 22 cents per pound for warp, and about 28 cents for filling.

Carding and Spinning Asbestos.

Editor Textile World:

I would like to know who makes machinery for working asbestos into yarn. Is there any publication on the subject of working this material? What is the asbestos worth as it comes from the mine? We have received the Textile World since the organization of our company, and value it very highly.

Fire Proof (34).

The M. A. Furbush & Son Machine Co., 12th and Market Sts., Camden, N. J., whose Philadelphia office is No. 428. The Bourse, make machinery for working asbestos. The working of this stock requires special cards and spinning machines, and they could give you full information as to the machines required and the cost of same, if you will inform them just what you want to do. There is no publication on the subject of carding and spinning asbestos. It is a special industry, carried on by a few firms who have had their machinery made for this particular work.

Most of the asbestos used in this country is imported from Canada, where there are very rich mines. It comes in duty free, and up to this time the Canadian mines had been able to supply the demand at such a price as to make the working of mines in this country unprofitable. In 1897, there were 580 tons of asbestos mined in the United States, valued at $6,450, or a little over $11 per ton. The asbestos imported into the United States during 1898 was valued at $302,050.

Asbestos, as it comes from the mine, varies greatly in quality and value. The best Canadian grade is much stronger and more elastic than the average asbestos mined in the United States, and, is consequently, much better for spinning and weaving. The fire resisting qualities of the various grades do not vary much, and for purposes other than weaving, such as packing, fire proofing, etc., the inferior grades answer as well as the more expensive qualities.

In Virginia and Wyoming, deposits of asbestos have been found equal to the best Canadian asbestos.

Fireproof Fabrics.

Editor Textile World:

What is the process employed for rendering fabrics fireproof.

Safety (40).

There is no way known at present to make fabrics of combustible material, absolutely fireproof. The processes employed serve to retard combustion and can be divided into two classes. The first includes those processes by which the fabric is impregnated with a substance converted at a high temperature into vapor that retards combustion. By the second process, the surface of the fabric is coated with a smooth fire resisting substance. For the first process, the ammonium salts are used. Experiments recently made in Germany indicate that sulphate and chloride of ammonium are objectionable, owing to their odor when heated. Silicate of soda, borax, and phosphate of soda are representative substances used in the second method. Silicate of soda makes the fabric stiff. A mixture of borax and phosphate of soda gives good results. The fabric impregnated with the mixture offers strong resistance to the flame, and gives out slight odor.

A mixture of borax, phosphate of soda, glucose and molasses works well. The glucose and molasses prevents the crystallization of the mixture, and causes it to penetrate the fabric better. Some substances, like ammonium phosphate, combine the qualities of both classes of mixtures named above, forming a glassy surface which resists the flame, and also gives out a vapor that serves to extinguish the fire.

Some of the substances more recently used, such as the salts of vanadium, tungsten and molybdenum do not volatize or melt to form a coating, but they penetrate, and, as it were, mineralize the fibre; the ammonium salts of these substances, however, are volatile. Better results were obtained by the use of molybdate or tungstate of soda, if the cloth was afterwards passed through a bath of hydrochloric acid, to form tungsten chloride on the fibre.

Certain precautions are necessary when treating dyed fabrics, in order to avoid

change of color. Neutral mixtures must be used when cloth has been colored with Purpurin or Congo dyes. All the substances so far used for fireproofing fabrics are removed if the goods are washed.

New Publications.

Commercial Organic Analysis by Alfred H. Allen. P. Blakeston's Son & Co., Philadelphia. Vol. III 589 pages, price $4.50.

This is third edition of the third volume revised and enlarged by Prof. J. Merritt Matthews of the Phil. Textile School. It treats of Tannins, Coloring Matters and Writing Inks. The developments in Industrial Chemistry have made necessary such extensive additions, alterations and rearrangements that this volume can be considered as a new work on the subject. The first section is devoted to Tannins or Tannic Acids, including the extraction, constitution and reaction of tannins, Gallotannic acid, tannin-yielding materials, qualitative recognition of tannin materials, analytical methods for determining tannis, examination of tan liquors and detection of adulterations. The second section treats of Dyes and Coloring matters, beginning with a historical sketch, and taking up successively the constitution and description of coloring matters under fourteen heads; 1, Nitro; 2, Azoxy; 3, Hydrozo; 4, Azo and Tetrazo; 5, Oxyketone; 6, Di and Triphenylmetham; 7, Indophenols; 8, Axoz-Thiaz and Azines; 9, Quinoline and Acridine; 10, Thiokensyl and Thiazol; 11, Unknown Constitution, 12, Natural; 13, Examination of Colors; 14, Examination of Dyed Fabrics. The concluding section treats of writing, marking, printing and invisible inks, and the examination of ink marks.

American Trade Index. Published by the National Association of Manufacturers. This is a book of 672 pages, published for the purpose of bringing the manufacturers of the United States and their goods to the knowledge of foreign merchants, in order to promote our foreign trade. It is divided into five parts. Part I. contains an alphabetical list, in English, of the members of the National Association of Manufacturers, with information as to their lines of business, cable and post office addresses, etc. Part II is the same list published in French. Part III is an alphabetical list of articles manufactured by the firms whose names are in the previous list, and accompanied by the names of the manufacturers of each article. Part IV. is a French-English index to the articles listed in part III. Part V. contains the telegraphic addresses of the members. This edition is for circulation in countries where the English and French languages are spoken; 7500 copies are now being sent free to leading business houses throughout the world. This book is not for distribution in the United States, and a charge of $5 per copy is made in this country. The publication of this Trade Index is one of the many practical steps taken by this association, to increase our much needed foreign trade.

Jeffrey Mfg. Co., Columbus, Ohio. This company has issued a 276 page catalogue of their goods, comprising a full line of chain belting, elevators, conveyers, carriers, power transmission machinery, etc. The catalogue is finely illustrated and should be on file ready for reference by mill managers.

Rope Transmission. The Dodge Manufacturing Company, Mishawaka, Ind. This is the title of an interesting little booklet issued by the Dodge Company, giving valuable information in regard to rope driving and power transmission. It is illustrated with a number of attractive half-tone engravings.

Color Cards Recently Received.

Benzidine Colors on mercerized cotton cloth. Farbenfabriken. Seldom is as attractive a line of colors seen as is shown on this card. It comprises 60 shades dyed on mercerized cotton cloth, together with the formulas and directions for dyeing.

Industrial News.

—We learn that the fall enrollment in the American Correspondence School of Textiles of New Bedford, Mass., is one of the largest in the history of the school. It is an encouraging sign, where so many are showing an interest in textile education. The school has just issued a new catalogue, which may be had free on application.

Cloudy Piece Dyes.

A dyer writes to Farber Zeitung of his having trouble with uneven and cloudy piece dyes which he finally discovered was caused by a lack of steam for boiling the dye liquor.

Boomer & Boschert Press.

Among recent orders received by the Boomer & Boschert Press Company, for their baling presses, we note the following: Walton Cotton Mills, Monroe, Ga.; Dublin Cotton Mills, Dublin, Ga.; Moultrie Cotton Mills, Moultrie, Ga.; Carolina Mills, Greenville, S. C.; Corsicana Cotton Factory, Corsicana, Texas; Coffee Cotton Mills, Enterprise, Ala.; Virginia-Carolina Company, Richmond, Va.; Binghamton Felting Company, Binghamton, N. Y.

These machines are giving good satisfaction wherever in use, and the large number of new orders received for them is conclusive evidence of the good reputation they have made.

Repeat Orders.

About three months ago, the Ring Frame Thread Protector Co., of Amsterdam, N. Y., equipped a number of representative mills in New England and the Middle States with their thread-protector on several frames, and they

are now beginning to get returns in the shape of large equipment orders from several of the most representative cotton mills.

Fleming & Chapin.

Fleming & Chapin, 229 Church Street, Philadelphia, manufacturers' agents for yarns, threads, tapes and braids, have notified the trade of several additions to their already extensive line of goods. Their enterprise in thus extending their business is additional reason why the trade should keep in touch with them. They carry a full line of tapes, braids, threads, domets, cambrics, silesias, etc.

Correction.

In the November issue of the Textile World appeared an item on "The Widest Hand Loom Table Cloth," woven at Ardoyne, Ireland. In this item, the statement was made that 300,000 yards of yarn was required for a square yard. It should have been a square, or table cloth, instead of square yard.

Tartaric and Citric Acid on Cotton.

Experiments made by A. Sheurer, to determine the action of lactic, oxalic, tartaric and citric acids on cotton in both hot air and steam, show:

(1) That lactic acid tenders the fabric at least as much as tartaric and citric acids. Oxalic acid was found to be the most energetic in this respect.

(2) That the tendering takes place just as well before steaming as after.

Sprinklers.

The International Sprinkler Company, 517 Arch Street, Philadelphia, are presenting to the trade strong evidence of the excellence of their sprinkler installations throughout the country in a booklet containing letters from many of their customers, stating their experience with the International sprinklers. They are unanimous in testifying to the efficiency of these sprinklers in case of fire, and their freedom from leakage at other times.

Charles T. Evans.

Charles T. Evans, through Messrs. W. Stursberg, Schell & Co., will have for the coming heavy-weight season the sole agency of men's wear fabrics of John Dobson's Old Town Mill, Falls of Schuylkill, Philadelphia, Pa., which were formery sold by Messrs. John and James Dobson.

A Talented Designer.

The beautiful sketch of the design for a satin quilt shown on another page of this number is the work of T. Hendry, who was for upwards of 14 years with Messrs. Barlow & Jones, Ltd., Bolton and Manchester. Mr. Hendry is now making his home in New York City. He has for some time been connected with American mills, but recently determined to take up the profession of public designer, and would be pleased to submit sketches for manufacturers' use in all branches of fabric design, including quilts, carpets, draperies, upholstery, fancy prints, dress fabrics, etc. Mr. Hendry's sketches will be one of the features in the Textile World hereafter.

Branch Office.

The business of the New York Blower Co., has increased so much that it has been found necessary to open a branch office at Chicago, in the Merchants Loan and Trust Co's building. In addition to this branch and the home office at Bucyrus, they have branches at New York and Boston.

American Steel in Germany.

The American Bridge Company have just closed a contract with the North German Lloyd Steamship Company, calling for the erection of two steel buildings on the banks of the River Weser at Bremen, Germany. The machine shop building will be 100 feet in width and 360 feet in length, two stories in height. The foundry building is 75 feet in width and about 600 feet in length. Both buildings are designed after the best American practice. The contract has been secured by the American Bridge Company in competition with the best German bridge shops, and shows the extent to which this class of work can be carried. This is a great triumph for the American Bridge Company, and we hope it will lead to further contracts of the same kind.

Cotton Softener.

Bosson & Lane, Boston, report a large increase of business in their Oleine, during this year. This product is made from castor oil, and is being extensively used in connection with dyeing cotton. It is quite a saver of labor, and makes brighter colors as well as softening the goods. It may also be used to much advantage on raw cotton, as a carding oil, where the stock is harsh, something being required to soften and allay the electricity. A very little goes a long way in this kind of work.

Waterproofing.

A good waterproof composition for cotton, wool or silk fabrics can, according to L'Industrie Textile, be made as follows: Two parts of an oil that dries quickly, such as castor or linseed, is mixed with one part nitro-cellulose. An addition of concentrated nitric acid will act as a dryer. The mixture is then dissolved with acetone or other solvent to the required consistency.

—The American Bridge Company is furnishing from its East Berlin, Connecticut plant, the steel work for Power Station No. 3 for the Hartford Electric Light Company, at Hartford, Ct.

The Fine Belt Service in the Big Mills.

It would be reasonable to suppose that, if the Bristol Mfg. Co., Bristol, Ct.; A. T. Atherton Mach. Co., Pawtucket, R. I.; Totokett Mills, Versailles, Ct.; Star Thread Mills, Athens, Ga.; Laurel Mills, Roswell, Ga.; Bemis Mills, Watertown, Mass.; Flint Mills & Kerr Thread Co., Fall River, Mass.; Thistle Mills, Ilchester, Md.; High Shoals Mfg. Co., High Shoals, N. C.; F. & H. Fries, Salem, N. C.; L. Banks Holt, Graham, N. C.; Dallas (Tex.) cotton mills and a good many others, said Cling-Surface gave them far better belt service than they ever had before, there probably would be some grounds for the fact. The Cling-Surface Mfg. Co. are anxious to send you reports from these mills as to their experience with Cling-Surface. The following letter is a representative report:—

Hope Mills, N. C., July 17, 1900
Cling-Surface Mf'g. Co., Buffalo, N. Y.

Dear Sirs:—In reply to yours of the 11th we wish to state that seeing your advertisement and as we had been having very serious trouble with some 6-in. double belts that positively refused to carry the load after more machinery had been added to their work, and as we could not run these belts very tight on account of shafting being too light to stand the strain. So, after having tried several kinds of belt dressing along with the kind we had been using and having to resort to all sorts of tactics to make them pull any at all and then the face was being peeled off them from constant slipping. So we ordered a trial package of Cling-Surface and the results were simply wonderful.

We find that Cling-Surface does all and even more than you claim for it. We send you a photograph of some of these belts now. They are running without a slip and carry full load with 12" sag in them. We have one belt with about 22" sag. The shafting and bearings are relieved of all unnecessary strain and bearings do not get as hot as they did previous to using Cling-Surface. Thus, we find that by the use of Cling-Surface considerable machinery may be added to a plant without increasing size of shafting and that any belt can be loaded to its full capacity and made to carry that load or pull the belt apart.

We now have on hand a package of Cling-Surface and hope never to be without it again. (This is unsolicited.)

Yours very respectfully,
G. & J. Fowler,
Overseers of weaving at Hope Mill No. 1.

Orianna Bleach Works.

These works located at 2562 Philadelphia, have been very busy on their regular lines. They bleach Turkish towels, cotton yarns, underwear, tapes and hosiery. Their equipment is modern and the experience of the proprietors Davidson & Brooke enable them to give the trade a high grade of work.

—The contract for seven new bridges on the Allegheny Valley Railroad, has been awarded to the American Bridge Company.

Insurance Against Strikes.

The U. S. Consul at Trieste reports that a number of Austrian manufacturers have recently formed an association for insurance against strikes. It is the object of the association to indemnify its several members for all losses sustained by them from unjust strikes which may break out in their respective establishments, whether voluntary, sympathetic, or forced. Each member is to pay a weekly premium equal to from 3 to 4 per cent. of the amount of his pay roll. The indemnity to be paid to him in case of a strike is to be, tentatively, 50 per cent. of the wages paid to his employees for the week next preceding the suspension of work.

American Moistening Co.

The American Moistening Company, Boston, Mass., report a large volume of business for the month, with orders for their system of humidifiers from the following cotton, silk, yarn and worsted mills:—

Baltic Mills, Baltic, Conn.; Opelika Cotton Mills, Opelika, Ala.; Mayo Mills, (repeat order), Mayodan, N. C.; Avalon Mills, Mayodan, N. C.; Monarch Cotton Mills, Union, S. C.; Iceman Mills, McColl, S. C.; Boston Duck Co., Bondsville, Mass.; Grendel Mills, Greers, S. C.; Lorraine Mills, Pawtucket, R. I.; Moorehead Cotton Mills, Moorehead, Miss.; Massachusetts Mills of Georgia (repeat order), Lindale, Ga.; Standard Cotton Mills, Cedartown, Ga.; Rodman, Heath Mfg. Co., Waxhaw, N. C.; Lavania Cotton Mills, Lavania, Ga.; Cheney Bros. (silk mill), So. Manchester, Conn.

Pond Lily Co.

The Pond Lily Co. Westville, Conn., are dyers of cotton piece goods and hosiery and yarn. They make a specialty of goods for the knitting trade. Their facilities are of the best, to supply goods of high quality and with low freight charges.

Napper Clothing.

Like the process of carding, that of napping depends for its success upon the quality of the clothing used.

For both carding and napping, the clothing must be adapted to the goods under treatment. The Columbia Napper Clothing Company, 81 Holly Street, Lawrence, Mass., make a specialty of napper clothing, and are thus equipped with both machinery and knowledge to supply the wants of each mill. They can duplicate any particular clothing, or can furnish special wire if required. They also make brushes for all kinds of nappers, and make a specialty for hosiery and underwear fleecers. A booklet which they mail on application gives price list and information as to their goods.

—The American Bridge Company is furnishing from its Lafayette plant, five bridges for Montgomery County, Ind.

Bands and Labels.

In our advertising columns will be found the card of the Docker-Foster Company of 123-125 N. Fifth St., Philadelphia, who have started to advertise their bands and labels with us. This is a matter to which the mills should give considerable attention, for an attractive band on the hosiery aids materially in attracting attention when the box of hosiery is opened, and very often the manner in which the goods are put up promotes their sale. The Docker-Foster Company make a specialty of the finest classes of bands and labels, and after an experience of a number of years, they are turning out the nicest and prettiest work. Their bands show good taste both in color and design. The hosiery mills will find it to their advantage to communicate with them.

Home Bleach and Dye Works.

During the past year the Home Bleach and Dye Works, Pawtucket, R. I., has been very busy on their Fast Black for various classes of textiles, also in dyeing fast colors on worsted goods.

Pan-American Power Plant.

One of the features of the power plant to be provided for the approaching Pan-American Exposition, at Buffalo, is a complete duplex induced draft apparatus. This will comprise two mammoth full housing upblast steel-plate fans, standing about 17 feet high with overhung wheels and water cooled bearings. These fans are direct connected each to a 12 by 14 horizontal center-crank engine with automatic governor, and are designed to serve 17 Manning boilers of about 300 horse power capacity, discharging the gaseous products of cumbustion into two short stacks of sheet steel. The fans, engines and breaching connections for the boilers, together with the steel-plate stacks themselves, are constructed complete by the Buffalo Forge Company of Buffalo, N. Y.

The same company is also building for the Exposition a horizontal center-crank Class A tandem compound engine of 300 horse power. The cylinders of this engine are 17 and 28 inches in diameter, with a common stroke of 18 inches. This machine will be applied to electric lighting purposes.

In addition it may be mentioned that the heating and ventilating plant for the permanent New York State building of which George Cary is the architect, will also be constructed by the above mentioned company. The apparatus will consist primarily of a heater and a large centrifugal fan, the latter driven by a direct connected 15 by 10 class A Buffalo Forge Company Engine.

Felton's Mill Brushes.

A catalogue issued by S. A. Felton & Son Company, Manchester, N. H., shows the many styles of brushes for mill use made by this firm. Their experience of fifty years in brush manufacturing enables them to supply the wants of manufacturers in this line in the most satisfactory manner. They manufacture revolving flat card brushes, cylinder comber brushes, furnishers for printing machines, card or grinder brushes, brushes for gigs, shears, and for cloth brushers, besides dabbing machine brushes for worsted combs, and for all purposes to which brushes are applied in textile mills. They also supply comber dusters, bottle brushes, or cylinder carder dusters, loom brushes, floor brushes, finger brushes, doctor brushes, picking brushes, besides scrub and sprinkler brushes. Every mill should have a copy of this catalogue. It contains much valuable information in regard to the best kinds of bristles for various purposes, and a careful perusal of the reading matter cannot fail to result in a saving of money for the mill.

Arlington Machine Works.

Sydney Birch has become associated with the Arlington Machine Works, Arlington Heights, Mass. Sydney is the youngest of the five sons of William Birch, the well known engineer and machinist of Salford, Manchester, England. He was at Somerville for several years, with his brother Albert, and later with the Rusden Machine Company, as leading draftsman and designer, and has had a large experience in building the best class of machinery. He will prove a valuable addition to the Arlington Machine Works, and like his brother Arthur is thoroughly familiar with the line of dyeing and finishing machinery.

The Howard & Bullough American Machine Co.

Among the orders received by the Howard & Bullough American Machine Company, of Pawtucket, R. I., is one for the full equipment of machinery for the new Alexander City Mills, Alexander City, Ala., besides revolving flat cards for Ensign, Bickford & Co., Simsbury, Conn., a repeat order for machinery for the Richmond Spinning Co., Chattanooga, Tenn., drawing, slubbing, intermediate, roving and fine jack frames for the large extension to the Ann & Hope Mills of the Lonsdale Co., Lonsdale, R. I., revolving flat cards and electric stop motion drawing frames for the Clover Cotton Manufacturing Co., Clover, S. C.

B. F. Sturtevant Co.

That the advantages of Mechanical Draft are recognized by experts, and that it is rapidly assuming its place as a rival and successor of chimney draft, is clearly evidenced by the fact that several of the technical schools have recently placed orders with the B. F. Sturtevant Co., of Boston, Mass., for the equipment of their boiler plants with this means of draft production. In several cases the fans have been so installed as to provide opportunity for experimentally comparing the chimney with the fan.

Forced Draught.

Rankine in his "Steam Engine" bases his calculations of results with forced draft on an air supply of only 18 pounds

of air per pound of coal, while those upon chimney draft are based upon 24 pounds, and then remarks that "with a forced draft there is less air required for dilution, consequently a higher temperature of the fire, consequently a better economy of heat than there is with a chimney draft." So also D. K. Clark in his work on the same subject states that "the system of forced draft opens the way for increase of efficiency in facilitating the adoption of grates of diminished area in combination with acceleration of combustion."

2500 Witnesses.

"2500 WITNESSES" is the suggestive title of a 56 page production of the advertising department of the B. F. Sturtevant Co., Boston, Mass. Being as announced in the sub-title "A List of Buildings and Sundry Steamships wherein the Sturtevant System or Apparatus Has Been Installed for the purpose of Ventilation and Heating." The introduction contains this statement:

"Some evidence is usually demanded by the prospective purchaser as to the extent and success of the application of the article or system under consideration. Printed testimonials, no matter what their tenor, are always more or less questionable as to their character. But a comprehensive list of purchasers and users, to each and every one of whom the inquirer is at perfect liberty to apply for information, forcibly presents, by its very numbers, the most indisputable evidence of widespread adoption, and provides the best possible opportunity for searching inquiry as to success. Such is the list which follows."

These names are the most emphatic, and, in fact, the only witnesses that this company desires to present as evidence of the successful operation of the Sturtevant System and Apparatus.

Blotters.

The Boston Belting Company have shown commendable enterprise in furnishing the trade with really good blotters that will absorb ink. These blotters will be kept in use on the desk, and thus keep the name of this reliable concern in view. They will be glad to send a supply to anyone making application.

Watchman's Time Detector.

The American Watchman's Time Detector records the movements of the watchman through the mill, and the record is made not in the mill, but in the office, where no tampering with the mechanism is possible. The watchman operates each station on his rounds, and by suitable electric connection with the clock, this working of the station key is recorded on the dial in the clock, showing at what time the watchman was at each station.

There is absolutely no way of a watchman beating this clock. He must do his duty, or the record next morning will show his neglect. The American Watchman's Time Detector Company, 234 Broadway, New York, N. Y., guarantee that their clock will do all that is claimed for it. As a matter of fact, no such guarantee is needed, for there are thousands of installations throughout the country, which have been doing the work satisfactorily for years, and to the proprietors of such establishments reference is made as to the merits of this Watchman's Time Detector. This company publish a catalogue, which they will send to any address upon application, which gives full information as to this clock, and a long list of those who have used it for over five years. They manufacture similar detectors for police departments of towns and cities, fire alarm systems and telephones for mills; also, time systems by which a number of clocks are controlled from a central station.

Pulley Covering.

The advantage of covering pulleys is now generally recognized. If, however, anyone still requires further evidence, he can quickly secure it by turning a metal surface pulley by applying the bare hands to this surface. The strength required for this work is principally employed in pressing the hand hard enough against the pulley to get the necessary grip. Now, if he will try the same experiment on a pulley having the pulley cover manufactured by the Warren Manufacturing Company, he will need no further proof of the merits of this one. This cover is very easily applied, as the illustration plainly shows. The surface obtained is durable, lasting many years. It has a natural affinity for leather, and serves to bring the belt in such close contact with the pulley that the atmospheric pressure of 15 pounds per square inch, still further increases the belt's driving power.

This cover is in use in many of our best mills throughout the country, and among the many letters from its users, we copy the following:

Fall River, Mass., April 16, 1900.
Warren Mfg. Co., Chicago.

Gentlemen:—We have used your Liquid Pulley Cover and find it satisfactory. You may send us two more cases.

Weetamoe Mills,
By R. Thackery, Supt.

St. Louis, Mo., April 2, 1900.
The Warren Mfg. Co., Chicago, Ill.

Gentlemen:—We have applied the pulley cover to two steel pulleys and it seems to be all you claim for it. Those two to which we applied it are overloaded and we had some doubts as to its staying qualities; but, so far it looks just as it did when we first put it on. We think it is O. K. Yours respectfully.

Home Cotton Mills Co.
J. B. Young, Supt.

Fall River, Mass., December 4, 1899.
Warren Mfg. Co.,

Gentlemen:—We enclose your order for two more cases of pulley cover, but would like to have you pack it in one box.

We had our supply house write you for the agency of it as this is quite a field. It would seem from the results we are getting that the demand would be unlimited.

Do you recommend it for wood-rim pulleys and also for pulleys that have been covered with leather lagging?

Yours very truly,
Wm. S. Potter, Treas., Flint Mills.

The Warren Manufacturing Company, 28 Jackson Street, Chicago, Ill., manufacturers of this cover, are finding a steady increase in the demand as the merits become better known.

Light.

Every available means has been employed during recent years to secure well lighted work-rooms. The advantage of light in our factories and work-rooms is self evident.

The old-fashioned narrow factory windows have given way to a construction in which glass forms the greatest part of the wall. The plain glass has been in many cases displaced by corrugated glass and glass prisms, in order to spread the light throughout the room and light up the dark corners. The electric light has given manufacturers a superior means of artificial illumination.

All of these methods of securing light depend for their efficiency upon having the walls of the rooms of such a shade that the light striking these surfaces will be reflected back into the room and made available for industrial purposes. Dark colored walls and ceilings absorb light, rendering it useless. For this reason, painting the interior of our buildings is of great importance as a means of illumination.

The Frank S. De Ronde Company, 54 John St., New York, have for a long time been manufacturing Lythite for both inside and outside painting, and the results of its use have been most satisfactory. It gives a firm, hard, pure white surface, and does not rub off, crock, or peel. It is of great durability, and its fireproof composition renders it a protection against fire. Lythite is a paint, and not a kalsomine. It is free from glue, and it has demonstrated its efficiency in supplementing the work of the sun, gas, and electricity for illuminating the interior of our factories and warerooms. It is equally well adapted for outside use.

Good sized practical working samples of Lythite will be sent free of charge to responsible concerns making application.

Stealing Help.

Probably every textile manufacturer has at some time or other, when short of help, sent an overseer or secondhand or some agent into another mill town to offer inducements to families to go to his mill. A manufacturer who loses good hands in this way naturally feels rather disgruntled about it, but, in his turn, will send out his skirmishers to fill vacancies, if they cannot be filled in town.

These agents thus looking for help are not the most welcome visitors, and sometimes their experiences are not at all pleasant. An amusing incident was recently related to us of where the agent of a large cotton mill in a Massachusetts mill town where family help is scarce, took upon himself the commission of securing family help from a competitor's mill in another city. After several nights' work, he succeeded in inducing ten or a dozen families to move, and having been rather more successful than he had anticipated, found that he did not have the necessary cash at hand to pay their traveling expenses. It seems that the superintendent of the mill from which the help was stolen, complained to one of the proprietors, who was also interested in other mills, of what had happened. The superintendent the next day received a request from the owner to call at his office. Upon doing so, to his surprise there sat the visiting mill agent who had called upon this mill owner for a small loan for the purpose of getting the families out of town. His feelings can be imagined when confronted by the superintendent of the very mill from which he was stealing the help and learning that it was from the owner of the mill that he had been requesting assistance to take away his operatives. As, however, the matter had gone so far, and the help had made up their minds to go, it was wisely decided to carry through the original plan, and forthcoming cash was advanced to get them out of town.

In this case, and, indeed, in most all instances where help is obtained in this way, it is seldom that the most desirable families can be induced to change. It is the roving, restless and least desirable operatives who are most easily influenced.

The Firth & Foster Co.

The Firth & Foster Co., Philadelphia, Pa., are getting their Berry Boilers in place to be ready for use within a few days. Their color dye house is kept busy and some of the lines shown in pastelle and high colors for spring are superb. The spring season is developing almost exclusively into piece dyed goods; armures, crepes and venetians predominating. All indications point to a substantial spring business.

New Correspondence Course on Woolens.

The Woolen Course which has just been added to the other courses taught by the

American Correspondence School of Textiles, New Bedford, Mass., is proving very popular, judging from the large number of inquiries regarding it, which have come to the school, and the large demand for the free descriptive catalogue issued by the school.

The Industrial Overseamer.

Perhaps in no branch of the textile business has such rapid progress been made as in the manufacture of knit goods, and this has been largely made possible by the vast improvement in machinery upon which they are made, particularly in the various ingenious machines concerned in the finishing of the product. One of these machines will accomplish in a day many times the amount of work which formerly required the employment of at least three different machines. Today the finishing machines manufactured by American firms, because of their speed and general excellence, are finding an easy market in all countries.

The line of machinery introduced by the Industrial Manufacturing Co., of Camden, N. J., including overseaming, over-edging, welting and trimming machines, is meeting with hearty reception and proving itself an important factor in the trade. They sell their machines outright for a very reasonable price, and have made a strong fight against the royalty system, in this respect having the hearty cooperation of many manufacturers, who have felt an aversion to paying royalty. The textile business has never taken kindly to the royalty idea, which has been so widely prevalent in other branches of the trade, and, with one or two exceptions, it has not been very generally adopted in textiles.

The Industrial Mfg. Co. has since its formation, three years ago, been successful in maintaining their position and have extended their business in the lines originally mapped out by them. The strong features claimed for their machines are simplicity of construction and ability to wear well. The merits of their trimming attachment have been acknowledged and commended by many practical mill machinists.

Scouring Compounds.

In Dr. Stiefel's book on Scouring, he gives the results of analyses of various English and German scouring compounds, indicating the different brands by numbers. No. 1 was composed of 90 per cent. calc. soda, 5 per cent. borax and 5 per cent. water; No. 2, 91 per cent. calc. soda, 6 per cent. sal ammoniac, 2 per cent. soap, 1 per cent. water; No. 3, 90 per cent. calc. soda, 2 per cent. borax, 3 per cent. water and 5 per cent. sulphate soda; No. 4, 80 per cent. calc. soda, 5 per cent. water, 10 per cent. Glauber's salt, 5 per cent. common salt; No. 5, 40 per cent. caustic soda, 30 per cent. soap, 10 per cent. starch, 20 per cent. water.

—The American Tin Plate Co., of Chicago, Ill., have repeatedly duplicated their orders for Cross Oil Filters, and are now using 19 filters in their plant. This speaks well for the popularity of the Cross.

Patents.

D. P. Wolhaupter has established himself at 1003 F Street, N. W., Equitable Building, Washington, D. C., as solicitor of patents, and is prepared to give special attention to textile business. Mr. Wolhaupter has had an extensive experience in this business, and was for a number of years in charge of the specification writing department of one of the largest firms of patent solicitors in the country, and handled all of their technical cases and legal opinions. He holds a degree of Master of Patent Laws. Mr. Wolhaupter's experience in this department, and his natural mechanical ability fits him to serve inventors promptly and satisfactorily. He refers to ex-Commissioner of Patents, Ellis Spear, Washington; ex-Asst. Commissioner of Patents, Arthur P. Greeley, Washington, D. C.; ex-Patent Office Examiner, F. W. Winter, 426 Diamond Street, Petersburg, Pa.; The Fisher Typewriter Company, Cleveland, Ohio, and New York City; Glascock Bros. Manufacturing Co., Muncie, Ind.; Paul E. Wirt, the well known fountain pen manufacturer, of Bloomsburg, Pa. There are a horde of irresponsible patent attorneys in Washington. Mr. Wolhaupter does not belong to this class, and we believe our readers can do business with him with the assurance that they will be honestly and ably dealt with.

Raw Hide Gears.

There are many machines in our textile mills on which it is necessary to operate gears at a high speed. The noise made by them is a very great objection, as it jars upon the nerves and impairs the efficiency of the operatives. In addition to this objection, the gears wear out very rapidly at the high speed.

The raw hide gears, manufactured by the New Process Raw Hide Company, of Syracuse, have now been in use for many years, and have been subjected to very severe tests, particularly in the electric railway service, where high speed is essential and noise very objectionable. The test made by the Schenectady Street Railway Company, shows the difference between steel gears and the raw hide gears. The general manager of this company, in a letter dated October 6, 1894, writes: "On May 10th, we equipped an open car with steel pinions. On May 26th, we equipped an electric car with raw hide pinions, made by the New Process Raw Hide Company, of Syracuse. Today, the steel pinions are worn out, and have also worn out the axle gears in which they mesh, while the raw hide pinions are not nearly worn out, and the axle gears in which they mesh are not worn perceptibly. During this time, both these cars have averaged the same mileage—100 miles per day." This is very convincing testimony, and if the raw hide gears stand this test in the railway service, there is no reason why they should not give equally good satisfaction in other places.

We would suggest that textile manufacturers investigate this matter, and make a test on some of the machines which are now wearing out metal gears rapidly, such as spinning frames, mules and twisters. Then there are the fulling

mill gears. They create a perfect din in the finishing room, and it is possible that the use of one raw hide gear on each mill would be a great improvement. There are many other machines throughout the mill where these gears would work to advantage. In addition to gears, this company manufactures bushings, which are used in loose pulleys, obviating the necessity to a great extent for oiling the pulley. The superintendent of the Straight Line Railroad, Syracuse, N. Y., says: "I put the raw hide bushings on to loose pulleys throughout our shops, and they gave by far the best satisfaction of any material known to me."

The New Process Raw Hide Company, Syracuse, N. Y., were the pioneers in the manufacture of raw hide gears, and during the years in which they have carried on this business, they have acquired a vast fund of experience, which enables them to make valuable suggestions to people having trouble with gearing. They furnish the blanks for raw hide gears if desired. Their catalogue gives additional information and price list.

Edward Jefferson & Bro's. Removal.

Edward Jefferson & Bro., the well-known worsted machinery firm of Philadelphia, have removed from 28 Strawberry St., where they have been for the past three and a half years, to more commodious quarters at 127 South Second St. and 133 Sansom St. The building is L shaped, seven stories, two floors being below the level of the street, and the firm occupies the entire building, which gives them 15,000 square feet of floor space. The two basement floors, also the third and fourth floors, are used for the storage of stock carried, which includes practically everything used in a worsted mill, both new and second-hand machinery always on hand. The top, or fifth floor, is used as a machine shop, also as an assembling room, and is in charge of Mr. W. B. Jefferson. One-half of the third floor, front of entrance floor, is partitioned off for the office, and also a private office. The firm will have, when entirely settled, facilities for showing their various machinery in motion before shipping, a new departure in this line. They have just equipped the entire plant of the Maine Alpaca Co., of Springvale, Me.

The firm is composed of Edward Jefferson, who attends to all outside business, and his brother, Mordecai Jefferson, who attends to the office department. The firm represents the following English concerns:— J. B. Farrar & Son, Henry Highley, Highley & Co., W. B. Lee & Co., J. Briggs & Co., Arthur Heaton & Co., Bradford Steel Pin Mfg. Co., and I. Foulds & Son, and also are agents for a well-known manufacturer of flax, hemp and jute machinery.

—Jos. H. Williamson, who for nearly eighteen years has been the business manager of the Manufacturers' Advertising Agency, New York City, has severed his relationship with that company to connect himself with the old established Viennot Advertising Agency, No. 524 Walnut Street, Philadelphia, as its business manager in the place of Mr. Thompson, resigned. Mr. Williamson desires to express his appreciation of the uniform courtesy extended to him by his many friends in the trade paper and general advertising field in the past, and will be glad to welcome them at any time at his new address, either at the office in Philadelphia, or at the New York office of the Viennot Agency, No. 127 Duane Street, Graham Building.

—The American Steel Hoop Company is going to put in steel bins at its Isabella Furnaces, Aetna, Pa. This will require about 750 tons of steel, which will be furnished from one of the Pittsburg plants of the American Bridge Company. The bins will be made in accordance with the design of Julian Kennedy, mechanical engineer.

—The American Bridge Company has a contract for furnishing over 700 tons of structural steel to go to the New York Navy Yard Naval Powder Depot, near Dover, N. J., and to the Naval Magazine at Iona Island, N. Y.

MILL NEWS.

Cotton.

New Mills.

—*Alabama, Alexander City. Site has been purchased upon which the buildings for the Alexander City Cotton Mills, recently incorporated with capital stock of $200,000, will be erected. Although but 10,000 spindles will be installed at first, the buildings will be built so as to permit doubling the capacity at a future date. It is also stated that a knitting plant is contemplated in connection with the new cotton mill.

—*Alabama, Anniston. Work has been somewhat delayed on the Woodstock Cotton Mills and the machinery is now being placed in position as rapidly as possible. A complete electric light plant has been installed.

—*Alabama, Athens. Machinery has arrived for the new plant of the Athens Cotton Mill Co., of which C. E. Frost is secretary and treasurer. As previously reported this mill will begin operations about March 1st, 1901, making single and twisted yarns.

—*Alabama, Mobile. The Barker Cotton Mills are nearing completion. The shafting is being put in place and the foundations for the engines are being built. When giving full report of the plant in an earlier edition it was reported that the mill would start in September, but it will now be started up as soon as possible.

—*Alabama, Opelika. The Opelika Cotton Mills contemplate having the plant ready to begin operations next month; the buildings being nearly completed and the machinery installed.

—*Arkansas, Hope. We have been informed, by C. A. Bridewell that a committee of business men has been appointed to investigate opinions of the citizens regarding establishment of a cotton mill. They propose building a mill, with capacity of 5000 spindles and 150 looms, with capital stock of $100,000. Sheetings, shirtings, osnaburgs, etc., will probably be made if plan is successful.

—*Alabama, Sylacauga. The McDonald Cotton Mills, $150,000 capital stock, under new management, with D. L. Lewis president and Jno. T. H. Lewis, secretary and treasurer, will be started up about March 1st., 1901. Hosiery yarns, 10s to 26s will be made. Plant will be equipped with 10,080 spindles.

—Alabama, Talladega. Application for a charter has been made by Cecil Browne, R. W. Henderson and E. T. Haynes for the Chinnabee Cotton Mills, with capital stock of $75,000.

—*Arkansas, Monticello. Work will soon be started on construction of the Anderson Cotton Mill, as the fair grounds have been purchased for site. A tract of land between the fair grounds and the railroad has also been purchased for warehouse purposes.

—*Georgia, Dallas. The Paulding County Cotton Mfg. Co., capitalized at $100,000, has the plant ready for operation. The main building, which is 2 stories high, together with a boiler and engine house, has a capacity of 5000 spindles. C. L. Strolls is superintendent of the plant.

—*Georgia, Dublin. Work is progressing on construction of the Dublin Cotton Mills, the brick work on the main building having been completed. The boilers will be installed in a few days. The company, of which Wm. Pritchett is president, expects to have plant in full operation February 1st.

—*Georgia, Eatonton. Work has been started on construction of the Middle Georgia Cotton Mills. A four-story building, with capacity for 12,000 spindles and power plant to operate that number, will be built. The company will at first install only 5000 spindles and 125 looms for manufacturing sheetings.

—*Georgia, Louisville. We have been informed by W. P. Lowry that the cotton mill project at this place has been abandoned.

—*Georgia, Rome. Work has been started on erection of the new mill here for the Anchor Duck Mill. This is the concern in which C. E. McLin is interested and which will manufacture heavy duck, with an equipment of about 30 looms.

—*Georgia, Social Circle. The Social Circle Cotton Mills, recently organized, are negotiating for a piece of land, which if secured, will warrant their starting work at once on building.

—*Louisiana, Shreveport. Ground has been broken for foundation of the Hargrove Cotton Mill, which we previously reported would soon start work on buildings. They expect to have plant ready to start production of goods July 1st, 1901.

—*Maryland, Elkton. Deibert & Wilson, proprietors of the new weave mill, expect to have the plant in operation shortly.

—*Massachusetts, Leominster. It is expected that operations will be started in about two or three weeks in the Reed Toy plant recently secured by the United States Thread Co., which will manufacture thread and cloth. Part of the machinery is in position. Mill is equipped with an 80 h. p. boiler and engine of same capacity.

—*Mississippi, Laurel. The Laurel Cotton Mills, capitalized at $250,000, with Geo. S. Gardiner, president, and J. T. Woodward, Jr., treasurer, will have their plant equipped with 10,000 spindles and 600 looms. They expect to begin operations about Feb. 1st., making 4-yard sheeting, 4/4-56 by 60.

—*Mississippi, Lexington. At a meeting recently held by the stockholders of the Lexington Cotton Mills, to take steps regarding purchase of site for new mill, etc., Hon. J. Wilson was elected president of the concern, M. M. Raynor, vice-president and J. A. Stanfield, secretary and treasurer. The capital stock, $100,000, has been subscribed.

—*Mississippi, Moorhead. The Moorhead Cotton Mills, C. H. Pond, president, will start operations January 1st. It was at first thought the plant would be ready to begin production of goods in November. Osnaburg and duck will be manufactured.

—Mississippi, Winona. The corner stone of the Winona Cotton Mill has been laid. This concern will manufacture coarse sheetings and drills.

—*Mississippi, Yazoo City. The Yazoo Cotton Mills Company will soon be ready to make contracts for buildings and machinery of the new plant, which they are to erect.

—*North Carolina, Albemarle. The No. 2 Mill of the Efird Mfg. Co. is nearly completed and machinery will now be installed. They will manufacture hosiery yarns in the new mill, which will be equipped with 5,000 spindles.

—North Carolina, Charlotte. J. P. Wilson and E. A. Smith, formerly with the Charlotte Supply Co., have incorporated a new company and will erect a $200,000 cotton mill, three miles west of this place. Work will be started on construction in about a month. Plant will be equipped with 10,000 spindles and 300 looms. E. A. Smith will be president of the new concern, name of which is the Chadwick Mfg. Co.

—*North Carolina, Concord. The Harris Manufacturing Company has been organized at this place with capital stock of $100,000. J. W. Cannon, now interested in various cotton plants, is president, and B. E. Harris, secretary and treasurer. Work will be started at an early date on construction of mill.

—*North Carolina, Henderson. The new building of the Harriet Cotton Mills, 75x 314 feet, two stories is about completed and work of installing the machinery, 7,500 spindles and 216 looms, has begun.

—*North Carolina, Hickory. The E. L. Shuford Mfg. Co. does not expect to begin operations before February or March, 1901.

—*North Carolina, Inman. A new cotton mill is to be erected at this place.

Company has been organized with capital stock of $200,000. A. H. Twichell and J. A. Chapman, Spartanburg, T. C. Duncan, Union and J. R. Gibson, Inman, are among the incorporators. It is proposed to have a 10,000 spindle plant with complement of looms. Work will soon start on securing subscriptions to the stock.

—North Carolina, Leaksville. Charter has been granted to the Leaksville Power House Company, for purpose of erecting cotton mills. Capital stock is placed at $200,000.

—*North Carolina, Raleigh. The machinery is being installed in the Neuse River Mill. This concern contemplates having the plant in operation early next year.

—North Carolina, Roanoke Rapids. The Putnam Textile Company, Gustavus Millhiser of Richmond and C. L. Patterson, incorporators, has started work on construction of new cotton mill. The new plant will be 320 by 106 feet, two stories high. Damask will be manufactured.

—*North Carolina, Smithfield. Work is nearly completed on construction of buildings for the Smithfield Cotton Mills, which will manufacture yarns. They will start installation of machinery about January.

—*North Carolina, Lumberton. The contract for erection of the Lumberton Cotton Mills has been let to the McColl Novelty Works, of McColl, S. C., who have started work on same. The main building is to be 100x225 feet, brick. Mill will be built on plan of accommodating 10,000 spindles, although but 5,000 will be installed at first.

—*North Carolina, Weldon. Work has been started on construction of the new mill for the Weldon Cotton Manufacturing Company. W. O. Burton has been awarded building contract. New mill will be equipped for spinning.

—*Oklahama Territory, Oklahama City. F. W. Smith, of Houston, Texas, is to organize a company of foreign capital and as soon as preliminary arrangements have been completed, work will be started on erection of the mill, which will be equipped with 3,500 spindles. It is thought that work of construction will be started before the first of the year.

—Santiago de Cuba. Domingo Corominas is the promoter of a stock company, which has among objects set forth in prospectus, the establishment of cotton and woolen mills in Cuba, and he writes us that he would be glad to get some facts about American machinery, and requests that any builders having Spanish catalogues will please forward same. He does not understand English.

—*South Carolina, Goldville. The Goldville Manufacturing Company's plant will be built for accommodation of 10,000 spindles and engine to operate that number will be installed, although the plant will be started with only 5,000.

—*South Carolina, Jonesville. The main building of the Alpha Cotton Mills is about completed and a greater part of the machinery has been installed. Cottages for the operatives have been built and partly occupied. They now contemplate having the plant ready to begin production of goods December 15th.

—*South Carolina, Lancaster. Contract for the erection of the new building for the Lancaster Cotton Mills has been let to F. C. Thompson & Bro., Columbia, S. C. The new mill will be four stories high.

—*Tennessee, Fayetteville. The buildings of the Elk Cotton Mills have been completed and it is expected that the machinery will soon arrive and be set up.

—*Tennessee, Knoxville. Operations will be started next week in the new plant of the Knoxville Cotton Mills, of which L. D. Tyson is vice-president and general manager.

—*Texas, Belton. Machinery is being received and installed in the building of the Belton Cotton Mills. The directors contemplate having the plant ready to start operation by February.

—*Texas, Fort Worth. The cotton mill project is again being taken up by J. A. Smith, of Denison, who is endeavoring to again interest the citizens in the project. Several thousand dollars have already been subscribed and a meeting will soon be held to make further considerations regarding the proposition.

—*Texas, Gonzales. Bids are now being received for erection of the Gonzales Cotton Mills. There has been some delay in adjustment of a title to the site, but since this has been overcome, the mill will be rushed to completion. It is expected that they will be ready to start operations about March 1st.

—*Texas, Waxahachie. At a recent meeting of the Board of Directors of the Waxahachie Cotton Mills, R. K. Erwin was elected general manager of the plant.

—*Virginia, Roanoke. Bids are now being received by the Roanoke Cotton Mills on all machinery necessary for complete equipment of the plant for making bail twine, etc. For some time the work has been held back, but will now be pushed to completion.

—*Virginia, So. Boston. The building of the new Century Cotton Mill is nearly completed. Operations will probably be started next year.

Enlargements and Improvements.

—*Alabama, Eufaula. The Eufaula Cotton Mills have recently installed 1100 additional spindles and 21 looms.

—*Alabama, Selma. The Estelle Cotton Mills have completed new addition to the plant, of 5000 spindles and 176 looms, which gives them a total of 10,000 spindles and 320 looms now in operation.

—Connecticut, Middletown. Work has been started on erection of a new building, three stories high, to be made to the winding and warping mill of the Russell Manufacturing Co. The new addition will be used for weaving, and will be equipped with 70 looms.

—Connecticut, Moosup. Floyd Cranska of the Cranska Thread Mill, contemplates having another story erected to the main

mill, which will increase the capacity of the plant.

—*Connecticut, Moosup. Three new cards and twenty spinning frames are being installed in the Union Mills of the Aldrich Manufacturing Co. An addition, 36 by 25 feet, is under construction to the old harness room.

—*Georgia, Columbus. The Eagle & Phoenix Manufacturing Co., whose plant has an equipment of 50,000 spindles, is to install 7000 additional ones, to bring the spinning capacity nearer that of the weaving.

—*Maine, Westbrook. The Dana Warp Mills now have 7,000 spindles in operation in their No. 2 mill, recently purchased from the Westbrook Co. They will have the balance, making a total of 10,000 in operation in a few weeks.

—*Massachusetts, Chicopee Falls. The new buildings of the Chicopee Falls Manufacturing Co.'s plant have been completed, with exception of some inside work. The boilers are now being installed in the new boiler house.

—Massachusetts, Fall River. An addition for purpose of increasing the frame spinning capacity of the mill, is being built to the No. 2 mill of the Osborn Mills.

—*Massachusetts, Hebronville. The Hebron Mfg. Co. is building a large addition to the plant. This mill is devoted to manufacture of yarns.

—Massachusetts, New Bedford. An addition, 125 by 82 feet, is to be built to the Whitman Mills.

—*Massachusetts, North Abington. The addition to be erected by A. C. Woodward, manufacturer of narrow web goods of all kinds, will be 80 by 46 feet, 2 stories. Twenty-two new looms will be installed and operations started about Jan. 1st. This will give plant a total of fifty-two looms.

—*Massachusetts, Westfield. Work is now under way on construction of new addition, 2 stories, for the Wm. Warren Thread Works.

—New Jersey, May's Landing. The May's Landing Water Power Company is to increase the looms in the weaving department from 444 to 500.

—New York, Oswego. The Standard Yarn Company is now considering the proposition of increasing the capacity of the mill.

—*New York, Valatie. Additional machinery is being installed in the Valatie Cotton Mill and as soon as alterations are completed, the mill will resume operations.

—*North Carolina, Charlotte. Work has been started on enlarging the Louise Mill building one third larger than present size, for purpose of increasing the spindles to 24,000.

—North Carolina, Concord. An additional story will be added to the No. 2 mill of the Odell Mfg. Co.'s plant, in which they will install more machinery.

—*North Carolina, Henderson. The Henderson Cotton Mills are to build another large addition next spring.

—North Carolina, Raleigh. The Raleigh Cotton Mills are to erect an additional building in which they will probably install more machinery.

—*North Carolina, Raleigh. We have been informed that report concerning erection of additional building by the Raleigh Cotton Mills is erroneous.

—*North Carolina, Rutherfordton. The capital stock of the Levi Cotton Mills Co. is to be increased from $50,000 to $100,000.

—*North Carolina, Tarboro. The Fountain Cotton Mills, previously reported to increase capital stock to $200,000, will install 5000 more spindles in the plant, giving them a total of 10,000 when completed.

—Pennsylvania, Chester. The Huston Manufacturing Co., in which Dennis Howarth and H. W. Huston are interested, is to erect another large mill on property at Green and Caldwell Streets. They are now having plans prepared for an extension to the present building, which will increase the capacity of the plant.

—Pennsylvania, Chester. Contract has been let for the erection of an addition of one story to the finishing department of the Aberfoyle Mills.

—Pennsylvania, Upland. New spinning frames are to be installed in the plant of S. A. Crozer & Son, cotton manufacturers.

—Pennsylvania, Wilkesbarre. The Wilkesbarre Lace Mfg. Co. is building a two-story addition to its plant, for purpose of increasing the capacity.

—Rhode Island, Westerly. It is reported that a large addition of another mill will be made to the William Clark Thread Mill of the American Thread Company.

—*Rhode Island, Woonsocket. It is reported that all the looms now in the Nourse Mill, will be transferred to the new weave shed, recently completed for the Social Mfg. Co. It is thought that the Nourse Mill will be devoted to manufacture of yarn entirely.

—*South Carolina, Cateechee. The Norris Cotton Mills inform us that they are to add 6,656 spindles and card room machinery to match to the plant. This new addition they expect to have in operation March 1st. 1901.

—*South Carolina, Darlington. It is reported that the Darlington Mfg. Co., which has recently installed 5000 spindles in the plant, contemplates expending about $100,000 more for spindles and necessary machinery and erecting a company store.

—*South Carolina, Tucapau. The addition to the Tucapau Mills, in which they will install 10,000 additional spindles, is nearly completed. As soon as the new machinery, wich will give them a total of 26,000 spindles, is put in operation, night work will be suspended.

—South Carolina, Union. It is reported that the Monarch Cotton Mills contemplate increasing the capital stock to $1,000,000.

—*Tennessee, Jackson. The Jackson Fibre Company, whose new mill at this

place for manufacturing bags, has been completed, will build an addition of 280 feet in 1901.

—*Vermont, Burlington. The Queen City Cotton Company informs us that the addition, mentioned in a previous report, is not for the manufacturing plant, but for stores and school room, but that they are adding 2215 spindles to the plant.

Mills Starting Up.

—*Alabama, Anniston. Operations have been started in the new plant of the Adelaide Cotton Mills.

—*Alabama, Riverview. The Riverdale Cotton Mill has resumed operations after a shut down of about three months. All the old machinery has been replaced with new.

—*Alabama, Tallassee Falls. The new mill of the Tallassee Falls Mfg. Co., of which F. D. Milstead is superintendent, is now in partial operation.

—Connecticut, Moodus. The cotton twine and duck mills, which have been shut down on account of lack of water for the past three or four weeks have resumed operations.

—*Indiana, Evansville. Operations have been resumed in the Evansville Cotton Mills, about one-half the strikers being furnished with employment.

—*Kansas, Independence. The Independence Cotton Mill, which has been closed for some time, has been reorganized under name of the Independence Cotton Manufacturing Co., with capital stock of $25,000. Operations will be resumed in about two weeks on an enlarged scale. They contemplate making additions to make up the product, now yarn and twine, into finished articles. D. Godfrey (Providence, R. I.) and J. M. Haney, Russelville, Ark.) are among the members of the new concern.

—*Maine, Waterville. The Lockwood Company has resumed operations in their mill which was shut down recently.

—New Hampshire, Greenville. Operations have been started in full in the No. 6 mill of the Columbian Manufacturing Co., which has been partly shut down for the past two months.

—*New Hampshire, Manchester. The Amoskeag Company's new mill, replacing those of 4 and 5, is about completed and in operation, although all of the machinery has not yet been installed.

—*New York, Valley Falls. The plant of James Thompson & Co., which has been shut down, is now running in full.

—*North Carolina, Charlotte. Crowley's Mills, which have been shut down for some time, have resumed operations.

—*Virginia, Petersburg. The Blue Ridge Mfg. Co. has resumed operations after a shut down of several weeks.

Mills Shutting Down.

—*Pennsylvania, Chester. The lace mills of T. I. Birkin & Co., whom we previously reported doubling the capacity of the mills, have been closed for a short time, in order to make necessary repairs. The additional looms will be set up as soon as possible and put in steady operation.

—South Carolina, Langley. The Langley Cotton Mills are idle owing to the weavers having discontinued operations, the outcome of a grievance. The company, which has specified a certain time for returning, if not fulfilled, will close the mills for two months.

—Vermont, Winooski. The Colchester Mills of the Burlington, Winooski & Colchester Mills, has been shut down indefinitely, owing to lack of orders.

Woolen.

New Mills.

—*California, Marysville. It is reported that a project is now on foot for the reestablishment of the woolen mills, which were destroyed by fire a year ago. The proposition has been made by a Portland (Ore.) capitalist for formation of a corporation with capital stock of $100,000 to construct new mills.

—*California, Eureka. The machinery is now being set up in the Humboldt Bay Woolen Mills, of which J. W. Henderson is president, and A. W. Berr, superintendent. The company contemplates beginning production of goods the first of next month.

—Canada, Ontario, Canning. The Canning Woolen Company has been formed by Fred E. Ferry and R. J. Tatham, the latter former assistant superintendent of the Dundee Woolen Co. of Passaic, N. J., and will operate a woolen mill, recently purchased. They will manufacture fine knitting yarns and stockings.

—Illinois, Peoria. W. H. Ballance & Co. contemplate establishing a shoddy mill at this place and are now considering purchase of machinery.

—Maine, Calais. The St. Croix Shoe Co. is installing a shoddy plant in the factory for making its own shoddy used for inner soles.

—*Massachusetts, Auburn. James Hilton, formerly proprietor of the shoddy mill at this place belonging to the heirs of the Albert Curtis Estate, has now purchased the same and will start at once on rebuilding the plant recently destroyed by fire. New building, upon which work has already been started on foundation, will be 2 stories high.

—*Ontario, Elmira. Operations will be started about January, 1901, in the new mill built here by the Elmira Felt Company, of which A. H. Erb, is president; I. Helborn, treasurer and A. J. Kimmel, manager. Felt, felt shoes and slippers will be manufactured. Mill will be equipped with 2 sets of cards. Dye house will be attached.

—Ontario, Golden Grove. The Golden Grove Woolen Mills Company has been incorporated with capital stock of $25,000, for manufacturing woolens. Among the incorporators are: Alex. Willis, Sr. and Jr., J. W. Willis of Golden Grove, and H. N. Sharp of St. John, N. B.

—Ontario, Elmira. A new felt mill, 120 by 50 feet, brick, 3 stories high, is to be

erected at this place. A separate boiler house and engine room will also be constructed. A. J. Kimmel, of Berlin, Ont., will have management of the plant, in which felt shoes and slippers will be made.

—*Pennsylvania, Clifton Heights. The new mill of the Kent Manufacturing Company, 312 by 62 feet, two stories high, has been completed and work started on production of worsted yarns. The plant has an equipment of 2 and one-half sets of French drawing, 8500 spindles and necessary carding and combing machinery. John C. Baldwin has the superintendency of the new mill.

—Pennsylvania, Reading. Ground has been broken preparatory to erection of large new mill for George Hendel & Sons.

—Rhode Island, Olneyville. Extensive additions and improvements are being made to the Delaine Mill, which contemplates hereafter making cloth for men's wear.

—Rhode Island, Wood River Junction. It is reported that John M. Walton, formerly in the W. A. Walton & Co. firm, whose plant was destroyed about three years ago, is to erect a weaving shed and finishing room on the former mill site for manufacturing woolen goods.

—*Wisconsin, Onalaska. The Onalaska Manufacturing Co. is a concern to be operated independently of the Galesville Woolen Mill, although Mr. E. Stickler was formerly connected with the Galesville plant. At present they will make garnetts and shoddy. I. H. Stickler is now in charge of the Galesville Woolen Mill.

Enlargements and Improvements.

—*Alabama, Anniston. Four additional looms are to be installed in the Anniston Carpet Mill. This concern now makes all-wool carpets in addition to ingrains.

—*Connecticut, Thompsonville. The looms in the old ingrain shop of the Hartford Carpet Co.'s plant, which have been idle for some time, will be put in operation at once.

—Connecticut, Winnipauk. Contract has beeen let by the Norwalk Mills Co. for the erection of an addition, 32 by 45 feet, 2 stories to the plant.

—Maine, Dexter. Work has been started on erection of a storehouse for the Wassookeag Woolen Company.

—*Maine, Dexter. Edward Chase, operating the old tannery property at this place, and who manufactures shoddy, will add another water wheel to the power equipment and some new carding machinery.

—Maine, Hartland. The Linn Woolen Company is now erecting a storehouse, 60 by 100 feet, 3 stories, so adapted that if found necessary later, machinery can be installed.

—*Massachusetts, Maynard. Extensive alterations and improvements are being made to the Assabet Mills of the American Woolen Co. Forty-five looms are being removed and replaced with newer ones; the lower spinning room in the Riverside building is to be used as a wool mixing room, the mules being taken out; the jacks in No. 2 spinning room are being removed and the old burling room is to be remodelled for offices. An addition will be built to the wet finishing room. A new large two-story building is to be erected to replace the waste houses. The company contemplates other changes, not yet definitely decided upon.

—*Massachusetts, Oxford. An addition, which is to be used as a dye house, is being built to David N. Taft's mill.

—Massachusetts, Plymouth. It is reported that several new looms are to be installed in the plant of the Mabbett Woolen Mill.

—Massachusetts, West Millbury. Work will soon be started on erection of a large addition to the Millbury Scouring Co.'s plant, Windle Bros., proprietors. New machinery is to be installed and the capacity of the plant increased.

—Massachusetts, Worcester. Work has been started on erection of an addition of a new building to connect the three mills of the Curtis Manufacturing Company. It will be of brick, three stories high.

—*Missouri, St. Joseph. The Buell Manufacturing Co.'s plant has been shut down while various improvements are being made to the mill. The new building, now under course of erection, will be equipped with new machinery. P. L. Clay of Philadelphia, has been engaged as general manager of the plant.

—New Hampshire, West Swanzey. The West Swanzey Mfg. Co. has replaced ten of the plain looms with fancy ones.

—New Jersey, Camden. The Fries-Breslin Company, manufacturing Smyrna rugs and carpets, will build an addition to their mill on the opposite side of the street, in the spring. This will enlarge their capacity one-fourth and will furnish employment for 150 additional people.

—*New York, Amsterdam. The new six-story building for S. Sanford & Sons is nearly completed, and it is expected to have it in operation in a short time.

—New York, Auburn. The Auburn Woolen Mills have recently installed two additional sets of cards in the plant.

—New York, Newburgh. An addition, 77 by 29 feet, one story high, is under construction for the Newburgh Woolen Mills. The annex will be used for drying purposes and a tentering machine will be installed. About $12,000 will be expended in improvements.

—Ohio, Covington. New carding and spinning machinery is to be installed in the Covington Woolen Mills, Mrs. Alfred J. Lewis, proprietess.

—Pennsylvania, Philadelphia. The Saxonia Dress Goods Mills, Howard and Palmer Streets, have increased the capacity of the plant by putting in 10 new looms.

—Pennsylvania, Philadelphia. Wolstenholme & Clarke, worsted merino yarn spinners, are increasing the capacity of their plant by the installation of 2224 additional spindles.

—Pennsylvania, Philadelphia. The new eight story addition to the John B. Stetson Co.'s plant is completed and machinery will soon be installed and plant put in operation.

—Rhode Island, Providence. An addition, 40x70 feet, one story, is to be built to the Atlantic Mills.

Mills Starting Up.

—Connecticut, Mechanicsville. All of the departments of the French River Textile Company's plant are running on full time.

—Connecticut, Putnam. The Putnam Woolen Co., which has been shut down for a number of weeks started up both mills on full time Monday, November 26th.

—Maine, Kezar Falls. A branch mill of the Kezar Falls Woolen Company's plant, located at Hollandville, has been put in operation, after an idleness of several months.

—*Maine, West Buxton. It is reported that F. H. Hargraves will soon start up the woolen mill, which has been shut down since July.

—*Massachusetts, Lowell. Operations will be resumed November 5th, in the Bay State Mills of the American Woolen Co., which have been idle for some few weeks.

—Massachusetts, Monson. The R. M. & T. Reynolds north mill, which has been idle for about two and one-half years, since the death of R. M. Reynolds, has been purchased at auction by Heritage & Hirst, who will operate the plant to its full capacity manufacturing woolen dress goods. Mr. Heritage was formerly superintendent of the Massasoit Woolen Co.'s branch mill at this place.

—*Massachusetts, Pittsfield. The Pittsfield Manufacturing Co., manufacturers of woolen yarns, have resumed operations after a short shut down.

—*New York, Dryden. Arthur Lull, who recently purchased the Dryden Woolen Mill, will manufacture blankets exclusively and has started up the machinery. Expects to have all the machinery in operation December 1st.

—*Pennsylvania, Philadelphia. Operations have been resumed in the drying and finishing departments of the J. A. Campbell & Bros.' Main St., Manayunk, plush mills, of which John C. Young is assignee.

—Rhode Island, Lafayette. The mills of the Rodman Manufacturing Co. have been started up.

—*Rhode Island, Wickford. It is thought that the woolen mills, Wm. Gregory, proprietor, will be put in operation soon.

Mills Shutting Down.

—Delaware, New Castle. The Knowles Woolen Mills have been shut down indefinitely.

—Massachusetts, Dedham. The Merchants' Woolen Mills, East Dedham, E. D. Thayer, Jr., owner, have been shut down.

—Massachusetts, Williamsburg. Attachments have been placed on the Cook Mills, G. C. Cook, proprietor, and the mills closed, probably permanently.

—Pennsylvania, Manayunk. The Manayunk Worsted Mills Company's plant, Mr. Greaves, manager, have been shut down for an indefinite period.

—Rhode Island, Providence. The Kinsley Worsted Mills, manufacturers of worsted yarns, which are at present shut down, are uncertain as to when work will be resumed.

Knit.

New Mills.

—*Alabama, Birmingham. Messrs. J. A. Yates & Co., who purchased the machinery of the Anniston Hosiery Mill, are having the same, with additional equipment, installed in building here and will start operations in about a month, making hosiery. Company will purchase yarn, doing their own dyeing.

—Alabama, Huntsville. It is reported that the Thompson Land & Investment Co. is interested in securing the establishment of a large knitting mill for manufacturing hosiery and underwear.

—*Georgia, Tifton. The Tifton Knitting Mills, which we previously reported contemplated beginning production of goods in December, inform that they will probably not be ready to start before February, 1901. Ladies' medium hose will be manufactured. Equipment will consist of 25 new Victor knitting machines. H. H. Tift and W. J. Austin are interested.

—*Georgia, Winder. Operations will be started about the 20th of November in the new mill of the Russell Manufacturing Co., capitalized at $20,000, with R. B. Russell, president; W. C. Jordan, general manager, and E. J. Adams, superintendent. This concern will make fine hosiery, full hose and half hose, operating 50 machines. At present mill is not equipped for dyeing. This was previously reported as the Winder Knitting Mills. Selling agents not selected.

—*Kentucky, Paducah. Contract has been let to F. W. Katterjohn, for erection of the Alden Knitting Mills Co.'s new plant for manufacturing ladies' hose and half hose. Work has been started on construction.

—*Michigan, Adrian. We understand that the new knitting mill at this place will be under the management of Ladd J. Lewis, formerly of Janesville, Wis. Mr. Lewis has been making his headquarters recently at Utica, N. Y., while purchasing machinery for mill and securing competent help.

—Michigan, South Haven. Negotiations are being carried on by Elmer E. Stanton of Grand Rapids, relative to establishing a knitting factory here.

—New Hampshire, Laconia. It is reported that a new hosiery mill is to be established at this place by Frank P. Holt, who is now getting out samples of goods, and if enough orders are secured, will start up machinery in O'Shea Bros.' mill.

—*New Jersey, Salem. The new knitting mill, which we previously reported to be established at Bridgeton, is to be located at this place, and known as the Priscilla Knitting Mills. The company, of which T. P. Eltonhead is president; T. S. Hoff, treasurer and J. H. Conover, agent, will manufacture underwear and hosiery, expecting to begin operations about Dec. 1st. They will have an equipment of 85 knitting machines. Goods will be sold by Boessneck, Broesel & Co., New York.

—*New York, Johnstown. Operations will be started about the 15th of December in the new plant of the Diana Knitting Company. The main building is 160 by 50 feet, 3 stories, with a separate power plant and a dye house, which is 40 by 90 feet. Men's, women's and children's underwear will be manufactured in plant, which will have an equipment of 75 machines.

—*North Carolina, Greenville. An electric light plant has been installed in the new mill of the Greenville Knitting Mills. This concern will soon be ready to start operations. This concern will manufacture men's underwear.

—New York, Utica. M. J. Fisher of the Fisher Knitting Machine Co. has leased the four-story Geary Building and will start up a new plant about the 1st of January, employing from 50 to 75 people. It is thought that the new industry will be a knitting mill. Machinery will be operated by electricity.

—*North Carolina, Elizabeth City. The Riverside Land Co., which we previously reported incorporated, for purpose of erecting a knitting mill, has raised the capital stock of $25,000. D. B. Bradford is president and A. L. Pendleton, secretary and treasurer. They will manufacture hosiery and will furnish employment for about 150 people. Plant will be equipped with a dye house and be operated by steam. Equipment not yet fully arranged for.

—*North Carolina, Henderson. Leon R. Strause is president; J. P. Taylor and J. B. Owen, treasurer and Oren C. Burt, general manager of the Seaboard Knitting Mills, which have been frequently making improvements and additions.

—*North Carolina, Raleigh. Work has been started on foundations for the new mill to be erected by the Raleigh Hosiery Co. The main building will be 100 by 40 feet, 3 stories high, with boiler and engine room, 45 by 30 feet. They will make a fine grade of hosiery in the new plant, where they will also add machinery for making children's and misses' hose, as also the finer gauges and finishes of ladies' hosiery. They will install their own dye plant. It is expected to have the mill in operation by February. S. A. Ashe, Jr., is general manager of the mills.

—*Ohio, Hamilton. The Pioneer Knitting Mills Co. has elected P. E. Schwab, president; E. O. Boll, secretary and treasurer and M. F. Chambers, general manager. The mill has a capacity of 200 dozen suits ladies' underwear daily.

—Pennsylvania, Allentown. W. C. Urner & Co., of Spring City, will establish a branch mill at this place. They have leased space in the I. A. Hall Building on Jordan & Walnut Sts., and will equip it with new machinery. Work will be started as soon as the machinery has been set in place.

—Pennsylvania, Ashley. A new hosiery mill, now under construction, will be operated as a branch plant of the Pioneer Knitting Mill, Plymouth, Pa., of which Ambrose West is proprietor. New mill will have capacity of 1200 dozen pairs of hosiery per day, furnishing employment for about 250 people.

—*Pennsylvania, Media. The project of the knitting mill, previously mentioned to be established here by Geo. Reif of Spring City, has now been abanoned on account of difficulties with the townspeople. The new mill will now be located at Spring City, where a building, 45 by 100 feet, 2 stories high, will be erected. The latest and improved machinery will be installed for making underwear. About 75 people will be given employment.

—*Pennsylvania, Myerstown. The new knitting mill established at this place by John N. Sherk, for making fine half-hose, will be put in operation in January. Plant will have an equipment of 10 machines, operated by steam. Has not yet contracted for boiler and engine.

—*Pennsylvania, Spring City. The new knitting mill to be erected here by George W. Reif, formerly secretary and treasurer of the National Underwear Co., will be equipped with 20 machines for making ladies' ribbed underwear. It is expected that the plant will be ready for production of goods April, 1901. Employment will be given to about 75 people.

—Rhode Island, Chepachet. Oscar H. White, operating a plant on fancy worsteds, and woolen yarns on commission, has started manufacture of hosiery, and operates 32 machines. Coarse gauge half hose will be made in black and tan.

—*Rhode Island, Woonsocket. The new mill established at this place by Geo. T. and Chas. Paquette, who have leased space from Wilkins & Co., 16 South Main Street, will be known as the Bernon Knitting Company. They will manufacture ladies' hosiery, operating 4 knitting machines, starting December 1st, 1900.

—*South Carolina, Blacksburg. The Blacksburg Spinning & Knitting Mill, capitalized at $25,000, with J. G. Whisonant, president and treasurer and John Meier, manager, expects to begin operations about the middle of January. The plant will be equipped with 80 machines for making men's half hose and misses' ribbed hose, in fast black and tan colors. The main building will be 50 by 100, two stories, with dye house 40 by 60, one story.

—*South Carolina, Conway. F. A. Burroughs informs us that after making investigations, that those associated with him in the project have decided not to invest in the hosiery knitting business.

—*South Carolina, Newberry. The main building of the Newberry Knitting Mill, upon which work of construction has already been started, will be 40 by 60 feet, with an engine room 21 by 25 feet. As previously stated, this plant, which will manufacture men's hose, expects to begin operations about January 1st.

—*Tennessee, Knoxville. The manager of the Standard Knitting Mills has recently been East and ordered complete equipment of the latest improved machinery, dye house, etc.

—*Texas, Denison. The Gate City Hosiery Mills have completed the installation of new dye plant and now have the mill in full operation.

—*Virginia, Portsmouth. Joseph A. Parker contemplates having his hosiery mill, for making children's hose and men's half hose, in operation about January, 1901. The plant will have 40 machines, furnishing employment for about 75 people.

Enlargements and Improvements.

—Massachusetts, Highlandville. Moseley & Co. are to erect an addition to their knitting mill.

—*Massachusetts, Ipswich. The two branches of the Ipswich Mills are to be consolidated. Everything at the lower mill, with the exception of the drying rooms will be transferred to the new part of the upper mill.

—Massachusetts, Lowell. The Pickering Manufacturing Company, at a recent meeting of the board of directors, voted to have a storehouse and an addition built to the present mill and also make investigations regarding project of building a modern dye house and a new mill for making yarn to be used by the corporation.

—Minnesota, Minneapolis. Contract has been let and work already started on erection of an addition, 50 by 156 feet, two stories and basement, brick, to the Northwestern Knitting Co.'s mill. The new addition will be equipped with new machinery and devoted entirely to manufacture of underwear.

—New Hampshire, Lakeport. Ten new machines have recently been installed in William Clow & Son's mill.

—New Hampshire, Lebanon. The Everett Knitting Works have recently installed 15 additional knitting machines in the plant.

—*New York, Greenwich. The new addition to C. C. Groat's mill will be 130 by 50 feet, 2 stories. Four additional sets of Davis & Furber cards and six self-operators will be installed. New addition will be put in operation about the 15th of December.

—*New York, Sherburne. The Canasawacta Knitting Mill contemplates increasing the capital stock from $12,000 to $25,000.

—North Carolina, Randleman. The Randleman Hosiery Mills will enlarge their plant to twice its present capacity. A fine grade of hosiery will be made on the new machinery, to be installed.

—Pennsylvania, East Stroudsburg. The Melrose Hosiery Mills, Thomas Henry, Jr., proprietor, are building a new dyeing plant for the Dubois system of sanitary fast black.

—*Pennsylvania, Leesport. Miller & Balthasar, who have recently installed 12 additional machines in the plant, now have a total equipment of 30, making men's fine seamless and misses' ribbed hose.

—*Virginia, Danville. Plans are now in process for increasing the capital stock of the Danville Knitting Co. and installing a new dyeing plant. The capacity of the plant is now 300 dozen pairs of stockings daily, which could be increased to double by running the plant nights. Company has its own steam heating and electric lighting plants and with additional water power recently acquired, will do all its own work.

—*Virginia, Norfolk. The Virginia Hosiery Company has completed installation of additional machinery reported previously. A new 45 h. p. engine, 40 new knitting machines and other machinery were installed.

Mills Starting Up.

—*Massachusetts, Lowell. Operations have been started in the Hooper Knitting Co.'s new plant. This concern manufactures ladies' and men's full fashioned seamless hosiery.

—*Massachusetts, Pittsfield. Operations have beeen resumed in full in the D. M. Collins & Co.'s mill, which has been running on half time lately.

—*Michigan, Centreville. W. Denton & Co., whose plant has been closed for some time, are about to start up, and are contemplating putting in considerable new machinery to bring their equipment up to date. This is a 4-set mill, making knitted sleeping garments.

—*New York, Little Falls. Robert MacKinnon will abandon operations in the Saxony Knitting Mills, which he has leased, as soon as his new plant is ready.

—*New York, Rockton. It is reported that the Eagle Knitting Co.'s plant, which has been idle for some time, will be started up soon.

—New York, Rondout. Operations have been resumed in the Cornell Knitting Co.'s plant.

—*Pennsylvania, Reading. Operations have been started in the Pennsylvania Knitting Mills Co.'s new plant.

—*Pennsylvania, Riegelsville. Operations have been resumed in the Lee S. Clymer Knitting Mills.

—*Pennsylvania, Wilkesbarre. Operations have been started in Morgan & Menzie's hosiery mill, recently completed, and replacing plant destroyed by fire. The dyeing will be done at the company's mill at Lee Park.

—*Tennessee, Chattanooga. The Ocoee Knitting Mill, which has leased space in the Evans Block, started operations on the 15th inst. This concern manufactures hose and half hose.

—*Vermont, Bennington. Operations have been resumed in full in the Campbell Knitting Co.'s plant.

Mills Shutting Down.

—*New York, Amsterdam. The Acorn Knitting Mill, H. S. McElwain, manager, has been shut down for two weeks.

—*New York, Fort Plain. The machinery is being removed from the Diana Knitting Mills, to the new plant at Fort Johnstown, where operations are expected to start December 15th, making underwear.

—Vermont, Bennington. The plants of the Valentine Knitting Co. and the Campbell Knitting Mills Co. have been shut down; also departments in the Cooper Mill.

Silk.

New Mills.

—*Illinois, Jerseyville. Plans are now being prepared for a two-story building for the new silk mill to be established at this place. A. W. Cross, president of the National Bank, is interested in the enterprise. The building, which will be 305 by 105 feet, will be half two story, with foundation to accommodate the remaining half to be made two story at any time. Silk ribbons are to be manufactured.

—*Maryland, Cumberland. Site has been selected and work will soon be started on erection of mill for the Klots Throwing Company, recently reported negotiating for a mill at this place. The company has been exempted from taxes for a period of ten years.

—*Massachusetts, Pittsfield. Jas. C. MacGowan, Jr., informs us that the new business established by him at this place will be for manufacture of silk thread in black only. The throwing and dyeing will be done outside. He only spools. Goods will be sold direct. New plant is to be operated under name of The Oriental Silk Thread Co.

—New Jersey, Clifton. John Keller, formerly with the Brandes Silk Co., of Paterson, N. J., has purchased land at this place, upon which he will start the erection of a large silk mill early next year. Broad silks will be manufactured, and employment given to about 100 people.

—*New Jersey, Paterson. The Lockman Bros.' Silk Company, 64 Ryle Ave., capitalized at $100,000, is reorganization of plant formerly run by Wm. Lockman. The plant is now equipped with 15 looms for manufacturing silks and ribbons.

—*Pennsylvania, Allentown. The West End Silk Mill has been purchased by a new company which will operate same under name of the Joseph S. Mack Silk C. Mr. Mack, formerly with the Bethlehem Silk Co., as superintendent, will have charge of the mill. Various improvements and additions will be made and the latest throwing machinery installed.

—*Pennsylvania, Hazleton. Operations have been started in the new plant of the Duplan Silk Mill Company, which also controls mills in South Bethlehem. The manufacture of silk will not be started for some time.

—*Pennsylvania, Meadville. The machinery is being installed in the Banner Silk Co.'s new plant. It was at first thought mill would be ready to start operations first of November, but for some reasons they will probably not be ready to start before January 1st. The main mill will be transferred to Meadville next year.

—*Pennsylvania, Pennsburg. The new silk mill to be started at this place will be under management of A. S. Schantz, who has purchased the machinery from the plant of the Castle Silk Co., which made an assignment early in the year. The mill was equipped with 50 looms, which will be shipped here and put in operation.

Enlargements and Improvements.

—*Connecticut, Stonington. About twenty-five new looms have been installed in the new addition, recently completed for the American Velvet Co.'s mill. Other new machinery will be added, including several shearing machines.

—*Connecticut, Willimantic. Operations have been resumed in A. G. Turner's silk mill.

—New Jersey, Newton. An addition, to be used for dyeing purposes, is to be built to the Sterling Silk Co.'s plant at this place.

—Pennsylvania, Allentown. Work has been started on erection of an addition, 51 by 89 feet, two stories and basement, to the Rionor Silk Mill.

Mills Shutting Down.

—New Jersey, Paterson. The silk throwing plant, operated by James McAllister & Co., has been shut down. It is thought that the plant may be sold.

—New York, Syracuse. The plant of the Syracuse Silk Company, Louis Will, president, has been shut down indefinitely.

Miscellaneous.

New Mills.

—*Massachusetts, Millis. The shafting and machinery has nearly all been placed in position in the National Flax Fibre Co.'s plant. Samples will soon be put through and the mill put in operation to the full capacity of the looms.

—*Massachusetts, Williamstown. Another addition will be built by the Boston Finishing Works. They have recently purchased land from F. H. Daniels for the purpose.

—*Michigan, Saginaw. The Saginaw Linen Campany, which has been formed by W. J. Thompson, and Messrs. McClure Sr. & Jr. of Saginaw, with capital stock, $50,000, for manufacturing linen and union crashes, contemplates having a plant equipped with about 60 looms. We have been informed by W. J. Thompson that if the project materializes, they will be in the market for all machinery except the spinning, which will be imported from Scotland.

—New Jersey, Paterson. The Paterson Silk Dyeing Association has been organized with capital stock of $5000 to dye and finish silk and sell dye stuff. Pierre. Thonnerieux and Jacques Heurtier are among the incorporators. Principal office of the company will be corner 6th Ave. and Shady St.

—New Hampshire, Meredith. The American Flax Manufacturing Co. is to make enlargements to the plant.

—New York, Wappinger's Falls. Work has beeen started on erection of a new boiler house for the Dutchess Print Works and when completed, five new boilers will be installed. A new chimney is also to be built to produce necessary draft for the new fires.

—*Pennsylvania, Philadelphia. The new bleachery to be established at this place by Chas. A. Rice, and associate, will be known as the Franklin Bleaching & Finishing Works, Ltd. Capital stock is $10,000. Chas. A. Rice, formerly of the Southbridge Printing Co., Southbridge, Mass., is president, and John McGill, Jr., of Philadelphia, secretary and treasurer. The plant will be located at West Philadelphia, where they will do a general business of bleaching and finishing cotton and linen piece goods.

—*Pennsylvania, Yardley. Work is progressing rapidly on the plant of the Cold Spring Bleaching & Finishing Works. The exact kind of work to be done has not yet been decided upon.

—*Rhode Island, Slatersville. The machinery will soon be installed in the Slatersville Finishing Company's new plant.

Fires.

—New York, Cohoes. Fire, which started in the carding room of the Hope Knitting Co., caused damage of about $25,000, which is covered by insurance. The mill will be shut down for two or three weeks for purpose of making necessary repairs.

—New York, Little Falls. Fire which started in the Eagle Mills, operated by the Titus Sheard Co., caused damage to the plant of about $20,000. Loss is covered by insurance.

—New York, New York. The Bamberger Knitting Mills, occupying quarters in building at 498 Broome St., were totally destroyed by fire which occurred recently.

—Ohio, Tiffin. The Tiffin Woolen Mills have been destroyed by fire. Loss, which is estimated at about $75,000, is covered by insurance.

—Pennsylvania, Miner's Mills. The hosiery factory operated by John Ayre has been badly damaged by fire.

Wisconsin, LaCrosse. The LaCrosse Knitting Works have been damaged by fire to the extent of several thousand dollars. Loss is covered by insurance.

Failures and Suspensions.

—Massachusetts, Boston. Fred Hartley, wool dealer, has made an assignment to Horatio G. Curtis, president of the Old Boston National Bank. No statement of liabilities and assets has been given out.

—New Jersey, Paterson. William Mutch, silk manufacturer, located in the Harding Mill, has filed a petition of bankruptcy in New York. The liabilities are estimated at about $37,768 and the assets consist of $1234, each in local banks and two $5000 twenty-year endowment policies.

—New York, Albany. Charles M. Friend has been appointed temporary receiver and J. Sheldon Frost, referee, for the D. J. Hamburger & Sons Company. The total liabilities are estimated at about $164,787.70 and the assets $146,783.59, less $7000 of mortgage indebtedness upon real estate.

—New York, New York. Receivers have been appointed for the firms of W. L. Strong & Co. and C. H. & F. H. Stott of Stottsville, N. Y. The deaths of Messrs. W. L. Strong and F. H. Stott, which occurred within a few days of one another, was the immediate cause of assignment, as many heavy obligations were maturing and no arrangements could be made to meet them. No statement of assets and liabilities has yet been made. These two firms are closely allied and their joint notes are in the market to a large extent.

—*New York, New York. Edward A. Treat of Treat & Converse, was appointed receiver for W. L. Strong & Co., and Smith Thompson, president of the Farmers' National Bank, Hudson, N. Y., for C. H. & F. H. Stott, whose assignment has been previously mentioned.

—*Pennsylvania, Philadelphia. Thomas Jaggers, woolen and merino yarn spinner, Allegheny Ave. and Emerald Street, whose failure has been previously reported, has been adjudged an involuntary bankrupt upon petition of certain creditors.

Facts and Gossip.

—Alabama, Pell City. A project is now on foot for the erection of a $75,000 cotton mill at this place. M. J. Healy, secretary of the Pell City Improvement Company, is interested in the enterprise.

—Connecticut, Hop River. The Excelsior Web & Tape Co.'s plant has been transferred to the Wright, Case & Wright Paper Co. and as soon as the necessary changes can be made, will be transformed for the manufacture of leatherboard.

—*Georgia, Warrenton. The B. L. Battle Manufacturing Co. propose erecting a large cotton mill, with capital of $500,000.

—Illinois, Zion City. Plans are now out for the new lace factory to be established here under name of Dowie's Lace Factory. The main building will be 200 by 600 feet. Considerable lace machinery is now being imported from England.

—Maine, Ellsworth. It is reported that Geo. Morrison, operating the Ellsworth Woolen Mills, contemplates locating elsewhere if satisfactory arrangements can be made regarding the starting up of another mill. The mill here will be closed unless the property is purchased by other parties.

—Maine, Kittery. The Sterling Thread Company, 105 Summer St., Boston, has been incorporated with capital stock of $50,000. Gustave Austin, Swampscott, is president and Joseph T. Leonard, Boston, treasurer.

—*Massachusetts, Blackstone. About 50 weavers in the Saranac Mill are idle owing to lack of warps.

PERSONAL RECORD.

Cotton.

—William Ames, after twenty-five years of service, has resigned as agent of the Phoenix Mfg. Co., Peterboro, N. H. He has been succeeded by William Knowles, his son-in-law.

—Benjamin T. Bragdon has accepted the position of superintendent of the Social Cotton Mfg. Co., Woonsocket, R. I. Mr. Bragdon was an overseer for the Great Falls Mfg. Co., Somersworth, N. H., for many years, and was one of its oldest employes. A few years ago he resigned, to retire from active business, but recently consented to again resume active duties with the Social Co.

—J. H. Bolton has secured the position of overseer of the carding room at the Belton, S. C., mill.

—A. B. Brannon, boss weaver, has changed from the Florence Mills, Forest City, N. C., to the Victor Mfg. Co., Greers, S. C.

—David Beausoleil, for several years overseer of weaving for the Manville Co., Manville, R. I., has severed his connection with that concern. William Haworth, lately arrived from Canada, succeeds him.

—J. W. Cargel, overseer of twisting with the Willimantic (Conn.) Linen Co. for the past twenty-one years, has resigned to engage in other business.

—W. P. Culbertson has been appointed overseer of carding and spinning of the new Cooloomee Cotton Mills, Cooloomee, N. C. He resigns as overseer of carding at the Henrietta, N. C., mills, to accept this position. He was for a number of years overseer of carding and spinning at the Rockingham, N. C., Steele Mills.

—William D. Cadwell has retired from the local agency of the Jackson Mfg. Co., Nashua, N. H., after serving in that capacity for nearly 30 years. He will continue to manage the affairs of the Nashua Mfg. Co., of that city. His successor at the Jackson Mills is William H. Cadwell, his son.

—T. S. Clark, who left Mammoth Springs, Ark., to accept a position with the Moorehead Cotton Mills, Moorehead, Miss., as superintendent, has resigned to become superintendent of the Bonham Cotton Mills, Bonham, Tex.

—William F. Davenport, after servfor 16 years as foreman of the Cranston (R. I.) Print Works, has resigned.

—J. A. Davis, recently overseer of the cloth room at the Cawthon Mills, Selma, Ala., is now filling a similar position with the Henderson Cotton Mills, Henderson, Ky.

—John Flynn, late of Medway, Mass., has taken a position in the mills of the American Flax & Fibre Co., Millis, Mass.

—Edwin Franklin, Waltham, Mass., has recently accepted a position with the Canoe River Mills, Taunton, Mass., as overseer of ring spinning.

—Henry Guillette, secondhand in the Whittenton Mills, Taunton, Mass., has been promoted to foreman.

—David Grove, at present superintendent of the mill of the Dyerville Manufacturing Company of Providence, is to be the new superintendent at the mill of the United States Cotton Company, at Central Falls, R. I., to succeed O. B. Parker. Mr. Grove was formerly overseer of the weaving room at the Hope Mill of Phenix and later was assistant superintendent at the Royal and Valley Queen Mills at Riverpoint.

—J. T. Hume has resigned as boss spinner at the Canoe River Mills, Taunton, Mass., and accepted a position as boss spinner with the Harmony Mills, Cohoes, N. Y.

—Walter B. Hall has been appointed superintendent of the Boston Duck Co. at Bondsville, Mass., succeeeding B. A. Alexander.

—T. J. Homer has been made overseer of weaving at the Louise Mill, Charlotte, N. C. Mr. Homer is from Rhode Island.

—W. P. Hornbuckle, who recently retired from the position of overseer of weaving at the Concord, N. C., Cabarrus Mills, has taken charge of the weave room of the Lynchburg Cotton Mills, Lynchburg, Va.

—J. H. Harris, for some time secondhand in the weaving department at the Erwin Mills, Durham, N. C., has been promoted to overseer of beaming and slashing at the same mill, succeeding W. H. Lanham.

—W. J. Howland, who has had charge of the office of the White Rock Mills, White Rock, R. I., has been appointed chief clerk and paymaster at the Hebron Yarn Mills, Hebronville, Mass., succeeding J. S. Robertson, resigned.

—W. J. Johnson, superintendent of the cotton mills at Mount Washington, Md., recently left that town, having been appointed superintendent of a cotton mill in South Carolina.

—John Jack, for a number of years employed at the Barnaby Mill, Fall River, Mass., the last few years as boss machinist, has resigned to accept a more lucrative position.

—C. F. James, formerly employed at the Eureka Cotton Mills, Chester, S. C., is now boss carder and spinner for the Fort Mill Mfg. Co., Fort Mill, S. C.

—J. Kirk has resigned as boss weaver at the Grinnell Mfg. Co., New Bedford, Mass., and is succeeded by E. Shorrocks.

—E. J. Lovern, boss carder and spinner at the Pearl Cotton Mills, Beverly, Ga., is now boss carder for the Monroe Cotton Mills, Monroe, Ga.

—James Lorner, formerly at Dalton, Ga., is now boss spinner with the Monroe Cottton Mills, Monroe, Ga.

—Mark A. Leavitt, boss carder at the Lyman Mill No. 2, Holyoke, Mass., has resigned, and gone to Griswoldville, Mass.

—Ed. Linskey, superintendent of the Riverside fine yarn mill, Montmorency, P. Q., has taken charge of the woolen yarn department of the Riverside Mill.

—William Lanham has severed his connection with the Warren Mfg. Co., Warrenville, S. C., in order to accept the superintendency of the Winder Cotton Mills, Winder, Ga.

—R. H. Layton, formerly secondhand of carding at the Florence Mills, Forest City, N. C., is now boss carder with the Cowpens Mfg. Co, Cowpens, S. C.

—Harold S. Lawton has resigned as president and manager of the Lawton Spinning Co., Woonsocket, R. I. C. F. Fletcher, son of Charles Fletcher, of Providence, R. I., is the vice-president of the company and is now acting as president and manager.

—O. W. Moore has resigned as superintendent of the Kesler Cotton Mills, Salisbury, N. C.

—A. Maynard, master mechanic at the Meridian Cotton Mills, Meridian, Miss., has resigned.

—J. W. McCauley, overseer of the weaving department in the Border City Mills Nos. 1 and 3, Fall River, Mass., has resigned. W. H. Perkins, formerly secondhand of the weaving department of No. 1 mill, will succeed Mr. McCauley in that mill, while W. F. Blake, secondhand of No. 3 mill, will be overseer in the No. 3 mill.

—Philip W. Mahler, for several years assistant superintendent of the Columbian Cordage Works at Auburn, N. Y., recently severed his connection with that concern, to accept the superintendency of a cordage works in Toronto, Can.

—John Nutall, who comes from Georgia, is the new overseer of weaving at the People's Cotton Factory, Montgomery, Ala. He takes the place of W. J. White, recently resigned.

—W. S. Norris, boss spinner for the Monroe Cotton Mills, Monroe, Ga., has taken a like position with the Cooleemee Cotton Mills, Cooleemee, N. C.

—Edward M. Oakes, of Lawrence, is now overseer of ring spinning at the mill of the Burlington Cotton Co., Burlington, Vt., succeeding T. E. Pray.

—P. H. O'Neal, of New Bedford, Mass., has accepted the position of overseer of weaving in the Sibley Mill, Augusta, Ga.

—W. F. Potter, for several years overseer of the spooling and shipping room of a large mill in Providence, R. I., has recently taken a position in the Granite Mills, Fall River, Mass.

—W. E. Poag has resigned as carder and spinner at the Highland Park Mfg. Co.'s No. 2 mill, Rock Hill, S. C., to accept the superintendency of the Carolina Mills, Greeenville, S. C.

—Guy G. Paris, a well-known carder, has been appointed overseer of the carding room in the Roger Williams Cotton Mills, Arcadia, R. I.

—O. B. Parker, who resigned November 3d as superintendent of the U. S. Cotton Co. at Central Falls, R. I., was given a banquet by the overseers of the mill and presented by them with a gold watch. Mr. Parker was superintendent of the company for 10 years. Before accepting another position, he will take a short vacation.

—Frank P. Perkins closed his connection with the Lowell (Mass.) Bleachery and Dye Works, November 1st.

—Joseph H. Stafford, son of Supt. Stafford of the Nottingham Mills, Providence, R. I., was recently presented with a gold watch and chain by the employees in the mills. He resigns to enter the employ of the White Rock Mills, White Rock, R. I.

—John K. Russell, who for a number of years had charge of the cotton mills at Millville and May's Landing, N. J., has resigned that position and is succeeded by Mr. Brainard, formerly at the H. N. Slater Cotton Co., Webster, Mass.

—G. E. Ridley is now boss weaver at the Caraleigh Mills, Raleigh, N. C.

—W. T. Royster, formerly card grinder in the Erwin Cotton Mill, Durham, N. C., is now boss carder in the same mill.

—Andrew Shields, of Philadelphia, Pa., has engaged with the New Haven Web Co., New Haven, Conn., as designer.

—M. G. Stone, who recently resigned the superintendency of the Whitney Mfg. Co., Whitney, S. C., has been succeeded by William Hinchliff, for a number of years superintendent of the Aragon Mills, Aragon, Ga. Mr. Stone will take a similar place at the Pacolet Mills, Pacolet, S. C.

—R. L. Thomas, recently with the Pee Dee Mfg. Co., Rockingham, N. C., has accepted the position of superintendent of the Smitherman Cotton Mills at Troy, N. C.

—P. L. West, superintendent, has severed his connection with the Eufaula Cotton Mills, Eufaula, Ala., to take December 1st the superintendency of a mill in Georgia.

—G. C. West, overseer of carding, has severed his connection with the Denison Cotton Mill, Denison, Tex.

—W. H. Willis, employed in the Aberfoyle Mills of Galey & Lord, Chester, Pa.,

has resigned to accept a position as designer in the Delaware Cotton Mills, Wilmington, Del.

—Isaac Whitehead, after 23 years of continuous service in the weaving department of the Wauregan Co., Wauregan, Conn., has resigned, on account of ill health.

—E. J. Wolf has resigned as overseer of weaving at the Tucapau Mills, Tucapau, S. C., having accepted a more lucrative position in the new Monaghan Mills, Greenville, S. C. E. C. Hill succeeds Mr. Wolf as overseer at Tucapau.

Woolen.

—George E. Brigham, of West Fitchburg, Mass., has been appointed boss dyer by the Georges River Mill, Warren, Me.

—F. H. Birkley, formerly boss dyer at the Hope Valley Woolen Mills, Hope Valley, R. I., has taken a similar position with Connor Bros., Holyoke, Mass.

—William Bassett, of Moosup, Conn., has taken the managership of the Queensbury Mills, Worcester, Mass.

—P. Coughlin, for three years with the American Felt Mills, Dolgeville, N. Y., and previously at Moosup, Conn., with Milner & Co., as wool scourer and carbonizer, has resigned and removed from Dolgeville to his old home in Moosup.

—Wm. E. Chamberlain, Jamaica, Plain, Mass., is now doing the finishing at Moosup, Conn., for the American Woolen Co.

—L. E. Chase has succeeded A. L. Reed as boss weaver in the Granite State Mills, Guild, N. H.

—Mr. Came of Woonsocket, R. I., is now filling the vacancy caused by the resignation of George Geoghegan, overseer of the weaving department of the Jefferson Woolen Mill, Jefferson, Mass.

—E. Davies, boss dyer for the Georges River Mill, Warren, Me., has resigned to take charge of the dyeing for the Standish Worsted Co., Plymouth, Mass., succeeding James Tupp.

—Louis Drexler, formerly of Philadelphia, has taken the position of overseer of dyeing in the Toronto Carpet Mills, Toronto, Ont.

—Norman P. Dempsey, formerly boss dyer for the Bemis Mills, Watertown, Mass., has resigned to accept a similar position with D. W. Ellis & Son, Monson, Mass.

—John Dickinson, formerly overseer of carding in the Lippitt Mill, Woonsocket, R. I., for nine years, and who has but recently returned from a several months' trip to England, has gone to Bonaparte, Ia., to take charge of the carding room.

—James Devine, boss finisher at the Taconic Mills, Pittsfield, Mass., has resigned and will go to Paterson, N. J., to a similar position.

—A. E. Davis, formerly assistant superintendent and designer of the Assabet Mfg. Co., Maynard, Mass., is now acting in a like capacity with the Amos Abbott Co., Dexter, Me.

—R. Davey, boss finisher, has changed from the Waterloo Woolen Co.'s mills, Waterloo, Ont., to a similar position in the mill of the Standard Woolen Co., Toronto, Ont.

—J. H. Evans, formerly overseer of carding and spinning at the Conshohocken Woolen Mill, West Conshohocken, Pa., has been engaged as superintendent of the Grand Forks Woolen Mills, Grand Forks, North Dakota.

—Samuel Emsly, formerly of Brookside, Mass., is now boss spinner in the worsted department at the Paton Mfg. Co., Sherbrooke, P. Q.

—G. O. Fiedler has been engaged by the Puritan Woolen Co., Plymouth, Mass., to assume charge of its designing department. Mr. Fiedler was formerly for many years designer at the Frost Mill, Hinsdale, N. H.

—Warren Gale, superintendent of the Puritan Woolen Mills, Plymouth, Mass., has resigned.

—Robert P. Grant, East Brookfield, Mass., has gone to Spencer, Mass., to become manager of the Spencer Textile Co.

—G. W. Gerry, in charge of the woolen department of the Riverside Mills, Montmorency, P. Q., has resigned.

—James Hardy, formerly employed for a number of years as overseer of carding for the Empire Woolen Co., Clayville, N. Y., is now engaged in a similar capacity at Watertown, Mass.

—W. T. Herrick, of Augusta, Ga., is the new boss carder at Lafayette, R. I., in the Rodman Mfg. Co.'s mills.

—R. H. Hartley has been appointed boss dyer at the Hope Valley Woolen Co.'s mills, Hope Valley, R. I., taking F. H. Birkley's place.

—George Henderson, for some time with the Assabet Mills, Maynard, is now boss weaver with the Cordaville Woolen Co., Cordaville, Mass.

—James Knox, who has for the past summer been boss dyer at Springvale, Me., is now in charge of the dyeing for the Rodman Mfg. Co., at Lafayette, R. I.

—J. E. Lang is now with the Ludlow Woolen Mills, Ludlow, Vt., as overseer of carding.

—A. McWilliams, formerly of Oxford, Mass., isnow boss carder at the Joseph Noon's Sons Co., Peterboro, N. H., being Mr. Joice's successor.

—John E. Musgrave is now dyer at the Dundee Woolen Co.'s mill in Passaic, N. J., filling the vacancy caused by the death of his father, A. Musgrave.

—James Madeley, for a number of years employed as overseer of carding by James & Geo. D. Bromley, carpet manufacturers, Philadelphia, Pa., recently resigned. F. Collier, employed for the past ten years in a similar capacity by Thomas Leedon & Co., Bristol, Pa., has accepted the position made vacant by Mr. Madeley.

—William S. Morrow has resigned as overseer of the card room in the Kennebec Woolen Mill, Fairfield, Me.

—G. C. Mackey, late of Methuen, Mass., has become a finisher for the Globe Hat Co., Montreal, P. Q.

—Robert Mann, recently with the Excelsior Woolen Mills, Montreal, P. Q., is now boss finisher for the Cornwall Mfg. Co., Cornwall, Ont., Can.

—B. J. Murphy, formeerly overseer of carding with Jesse Eddy's Sons for ten years at Fall River, Mass., is now employed in a simfiar capacity by the Passaic (N. J.) Woolen Co.

—F. A. Owen, formerly boss dyer in the Burlington Woolen Mills, Burlington, Vt., is now boss dyer for James Roy & Co., Watervliet, N. Y.

—C. L. Owen, superintendent of the Trent Valley Woolen Co., Campbellford, Ont., has resigned, and is succeeded by Mr. Burrows.

—Martin O'Toole has succeeded G. M. Ward as overseer of the finishing room of the American Woolen Co.'s Brown Mill in Dover, Me.

—George Pettengill, boss finisher for the Oneko Woolen Mills, New Bedford, Mass., has resigned.

—Fred Pohlman is now with the Conshohocken Woolen Co., West Conshohocken, Pa., as boss carder.

—John Ravenscroft, overseer of carding, is now engaged with F. C. Huyck & Sons, Albany, N. Y.

—James J. Rae, formerly of Passaic, N. J., is now overseer of carding at the Channing Smith Mill in Cherry Valley, Mass.

—G. S. Rosenberg has been appointed selling agent of the Bradford Mills, owned by John & James Dobson, of Philadelphia, Pa.

—G. H. Smith, boss machinist at the Lafayette Mill, Woonsocket, R. I., has resigned and gone to Providence, R. I., where he has secured a position.

—G. F. Smith, for some time boss carder for the Methuen Woolen Co., Methuen, Mass., has accepted a position in Worcester, Mass.

—Ellwood Smith, formerly at the Caledonia Mills, Clifton Heights, Pa., has taken a position as overseer of carding at the Imperial Woolen Mills, Manayunk, Pa.

—John C. Thickens, for the past 14 years superintendent of the Tillotson Mills at Pittsfield, Mass., resigned recently, to take a much needed rest.

—William Touhey has severed his connection with Cole, Senior & Co., Medway, Mass., and has taken a position in the weave room of the American Flax & Fibre Co., Millis.

—Louis C. Werner, late superintendent of the Taconic Mills, Pittsfield, Mass., has succeeded Edmond Corcoran as superintendent of the Hockanum Company, Rockville, Conn., who resigned to become resident agent of the Manton (R. I.) Mills of the American Woolen Company.

—D. Welsh, formerly boss finisher for the Kent Mfg. Co., Centreville, R. I., is now with the Saxonville Mill, Saxonville, Mass., having succeeded H. L. Hendries.

—Thomas Woodhead, formerly employed at the Charles River Woolen Mills, North Bellingham, Mass., is now in charge of the carding department at the Riverlet Woolen Mills, Uxbridge.

—Richard Westwood has resigned as boss weaver at the Guelph Carpet Mills, Guelph, Ont., Can.

Knit.

—James Brown, foreman of the No. 1 knitting room at the Glenark Knitting Mill, Woonsocket, R. I., has resigned to accept a position in Taunton, Mass., and William McGuire has succeeded him.

—M. W. Brooks, formerly with the Utica Knitting Co., has been appointed superintendent of the Mark Manufacturing Company at Herkimer, N. Y.

—Daniel J. Carey, Pawtucket, R. I., has recently secured the position of boss dyer with the Echo Knitting Mills, Boston, Mass.

—Fred Fenton, formerly a foreman at the Capron Mill, N. Y., has accepted a position as assistant to Miss Belle MacKinnon, superintendent of the MacKinnon knit goods plant, Little Falls, N. Y.

—Kenneth W. Harvey is the new boss knitter and finisher at the No. 3 Penman Mfg. Co., Paris, Ont., Can.

—Josiah H. Harvey, overseer at the American Hosiery Co., New Britain, Conn., for over ten years, has resigned, and accepted the management of a wholesale cigar and tobacco house for the Imperial Cigar Co., in Scranton, Pa.

—W. H. Laubeck, superintendent of the Windemere Hosiery Mills, Albemarle, N. C., has resigned, and Philip Hoffman, of Philadelphia, has been appointed to fill the vacancy.

—R. L. Lee, who has been connected with the Orangeburg Knitting Mill, Orangeburg, S. C., since its establishment six months ago, has resigned. James L. Weeks takes entire charge of the management of the mill, and C. P. Rogers becomes assistant superintendent.

—J. H. Prescott, of Stoughton, Mass., now has charge of the knitting, spooling and mending of the Dunham Hosiery Co., Naugatuck, Conn.

—James Polleycutt, Stoughton, Mass., has recently been appointed knitting superintendent of the Roxford Knitting Co. at Philadelphia, Pa.

—C. H. Richardson, of Danielson, Conn., has been engaged as superintendent of the cop yarn department in the new MacKinnon Knitting Mills at Little Falls, N. Y.

—Henry Stephens, formerly of Whitesboro, N. Y., is the new boss knitter at

the Everett Knitting Works, Lebanon, N. H.

—Theo. P. Talpey, who recently resigned as boss dyer for the Worthen & Aldrich Co., Passaic, N. J., is now with the Des Moines Hosiery Mills, Des Moines, Iowa, as boss dyer.

—James Towle, Cohoes, N. Y., is now overseer of carding in the Valentine Knitting Co.'s mill, Bennington, Vt.

—William H. Taylor, an expert English knit goods dyer, has been secured by R. MacKinnon, of Little Falls, N. Y., to superintend the laying out of his large dye plant in the new yarn mill and to take general charge of dyeing, etc., in the same when completed.

Deaths.

—Samuel K. Wilson, a widely known manufacturer of woolen goods, died at Trenton, N. J., November 26th. He was in his eighty-third year. Over 700 hands are employed in his two mills at Trenton. Mr. Wilson was also interested in a number of other enterprises, and at one time owned a controlling interest in the Trenton Street Railway Company, and at the time of his death owned the controlling interest in the Home Telephone Company, an independent local concern. Mr. Wilson was also the owner of a great amount of real estate.

—Frank H. Stott, head of the woolen firm of C. H. & F. H. Stott at Stottville, N. Y., died at his home in Stottville, November 4th. He was one of the best-known manufacturers in the textile trade, and a personal and business associate of the late ex-Mayor Strong.

—The death of Joseph Meek, late a member of the firm of Meek Brothers, owners of the Bonaparte (Iowa) Woolen Mills and Bonaparte dam, occurred last month. The deceased was one of the earliest Iowa pioneers. He moved to Iowa with his parents in 1835, when but five years old, coming from Michigan. They began operating a water power mill almost from the first. This was gradually enlarged until finally Isaiah, Robert and Joseph Meek started the woolen mills which have since become so well known in the West.

—Dwight F. Lincoln, a retired woolen manufacturer, died in Hartford, Conn., November 5th, in his seventy-sixth year. For over 25 years he conducted a mill in North Windham, but retired from active business life about 30 years ago.

—Thomas R. Gill, for many years a prominent dry goods commission merchant of Philadelphia, Pa., died last month at his home in that city. The deceased was 70 years old. He retired from business in 1878.

—Abram Marcellus, a leading citizen of Amsterdam, N. Y., and for 23 years a member of the firm of McFarlan & Co., knit goods manufacturers, died November 13, aged 79 years.

—Charles E. Drew, formerly of Baker & Drew, knitting mill owners of Woonsocket, R. I., died in Philadelphia on the 8th of November, aged 42 years.

—Col. Thomas G. Hood, senior member of the wholesale dry goods firm of Hood, Faulkrod & Co., died last month in Philadelphia, Pa., of pneumonia.

—William Constable, of Holyoke, Mass., committed suicide on the afternoon of November 6th. He was formerly a member of the firm of McCallum & Constable, hosiery and silk underwear manufacturers. He had been in poor health for some little time past.

—Samuel J. Wood, for a period of 36 years employed in the mills of D. Goff & Sons, Pawtucket, R. I., for some time being overseer of the braiding department, died recently.

—Charles Everett, of the dry goods commission firm of Wheelwright, Eldredge & Co., died recently at his home in Newton Centre, Mass. He was 43 years old. He had charge of the Merrimack Mfg. Co.'s department of the firm at Boston.

—W. C. Howard, president of the Dallas (Tex.) Cotton Mills and Sherman (Tex.) Cotton Mills died November 17th of Bright's disease. He leaves a wife and one son, Joel T. Howard, who is secretary and treasurer of the Dallas Cotton Mills.

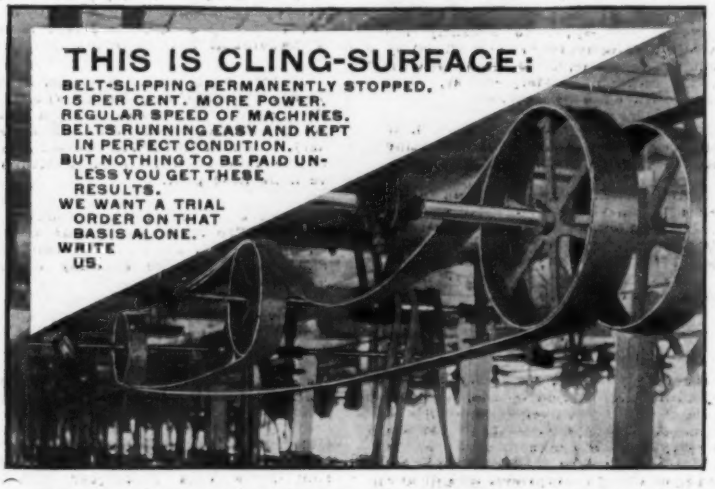
—G. A. Ramsdell, at one time governor of New Hampshire, died at his home in Nashua, last month, in his 86th year. He was a director in the Jackson Mfg. Co., the Nashua Mfg. Co. and other large corporations. A widow and four children survive him.

—S. Angier Chace, who was treasurer of the Union Mills, Fall River, Mass., more than 20 years ago, died at midnight November 1st, in his eighteenth year. A widow, two sons and a daughter survive him.

—Henry S. Hovey, a retired manufacturer and commodore of the Eastern Yacht Club, died at his home on Commonwealth Ave., Boston, November 19th. He was for many years owner of the Pittsfield Cotton Mills, Pittsfield, N. H., but gave up active business several years ago, and has since devoted a good deal of his time to his favorite sport, yachting.

—Charles Jackson, of the dry goods commission firm of Hyde & Jackson, of New York City, died recently at the St. John's Hospital in Brooklyn.

—Herbert M. Farr, 59, agent of the Farr Alpaca Co., of Holyoke, Mas., committed suicide at his home in that city last month, while temporarily insane, the result of despondency, caused by failing health. Mr. Farr was born in Chesterfield, N. H., May 28, 1841. In 1864 he began the manufacture of knitted goods and alpacas at Hespeler, Ont., but after a few years he saw a favorable outlook in the States, and removed to Holyoke. A company was formed with $250,000, and Jared Beebe was the first president and Mr. Farr acted as both agent and treasurer. Later the work of agent and treasurer was divided, Joseph Metcalf, who married a sister of Mr. Farr, being made treasurer.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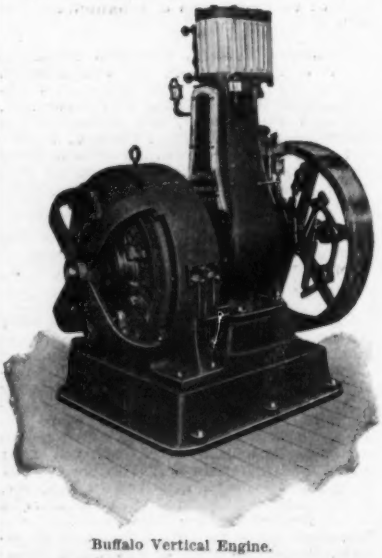

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Simplicity of Design,
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Efficiency of Lubrication.
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BUYERS' INDEX.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Alphabetical Index to Advertisements follows this Classified List.

Air Moistening System.
American Moistening Co., 150 Devonshire St., Boston.

Appraisals.
American Appraisal Co, Milwaukee, and 804 Park Row Bldg, New York.

Arc Lamps.
Lea Manufacturing Co., Elwood, Indiana.

Architects and Mill Engineers.
Berlin Iron Bridge Co. The, East Berlin, Ct.
Ferguson, John W., Paterson, N. J.

Artificial Stone.
Warren Bros. Co., 143 Federal St., Boston.

Asphalting & Asphalt Materials.
Warren Bros. Co , 143 Federal St., Boston.

Asphalt Roofing.
Warren Bros. Co. 143 Federal St., Boston.

Automatic Feeds for Cotton and Wool.
Atlas Foundry & Mch. Co., Newark, N. J.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Balling Machine.
Torrance Mfg. Co, 18 Davis St, E. Newark, N. J.

Bandings.
See under Yarns.

Bands and Labels.
Decker, Foster Co , Phila., Pa.

Belt Cover.
Warren Mfg. Co., Chicago, Ill.

Belting.
Alexander Bros., 410 No. 3d St., Phila., Pa.
Boston Belting Co., Boston, Mass.
Dodge Mfg. Co., Mishawaka, Ind.
Jeffrey Manufacturing Co., Columbus, Ohio.
Link Belt Machinery Co., Chicago, Ill.
Popham, Henry, & Son, Newark, New Jersey.
See also Mill Supplies.

Belt Dressing.
Alexander Bros, 410 No. 3d St, Phila, Pa.
Cling Surface Co., 168 Virginia St., Buffalo, N. Y.
Stephenson Mfg, Co., Albany, N. Y.
Warren Mfg. Co., Chicago, Ill.

Belt Hooks.
Bristols Co., Waterbury, Ct.

Bindings.
See Tapes and Braids.

Bleaching Materials.
Bosson & Lane, Boston.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Block Cutting for Printing.
Smith & Meinken, 427 West 13th St., New York.

Blowers.
American Blower Co., Detroit, Mich.
Boston Belting Co., Hyde Park, Mass.
Buffalo Forge Co., Buffalo, N. Y.
New York Blower Co., New York.
Sturtevant, B. F. Co., Boston, Mass.

Bobbins, Spools, Shuttles, Etc.
Murray, C. O., Nashua, N. H.
Parker, Henry Co, Springfield, Vt.
Sweet & Doyle, Cohoes, N. Y.
Tebbets, E. L., & Co., Locke's Mill, Me.

Boilers.
See Steam Boilers.

Boiler Compounds.
DeRonde, F. S. Co., New York.
Straus & Co., 59 Broad St., New York.

Boiler Tube Cleaners.
Coggeshall Mfg. Co., 130 1-2 Liberty St., New York.

Boxes, Cloth Boards, Etc.
Pearson, J. T, Kensington, Pa.

Braiding Machinery.
New England Butt Co. Providence, R. I.
Thun & Janssen, Reading, Pa.

Braids.
See Tapes, Braids and Edgings.

Brass (Perforated.)
See under Perforated Metal.

Bridges.
American Bridge Co., The, New York.

Brushes.
Felton, S. A. & Son Co., Manchester, N. H.
Jacobus, A. G. Verona, N. J.

Brushers
See Napping Machines.

Buildings (Steel).
American Bridge Co., The, New York.

Burr Pickers.
Atlas Foundry & Mch. Co., Newark, N. J.
Curtis & Marble Machine Co., Worcester Mass.
Sargent's, C. G., Sons, Graniteville, Mass.

Calico Printers' Machinery and Supplies.
Arlington Machine Works, (Arthur Birch) Arlington Heights, Mass.
Birch Brothers, Somerville, Mass.
Butterworth, H. W., Sons & Co., Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Phillips Co, The Thomas, Providence, R. I.
Taunton New Bedford Copper Co., New Bedford, Mass.
Rusden Machine Co., Warren, R. I.
See also Dyeing, Bleaching Machinery, etc.

Carbonizing.
Philadelphia Wool Scouring & Carbonizing Co., Philadelphia, Pa.

Card Clothing.
Ashworth, Elijah, Fall River, Mass.
Booth, Benj. & Co., Philadelphia.
Buck Card Clothing Co., Palmer, Mass.
Leigh, Evan A, 35 Mason Building, Boston.

Card Grinding Machinery.
Hardy Machine Co., Biddeford, Me.
Roy, B. S. & Son, Worcester, Mass.

Carders' Tools.
Brown, W. H, Mechanic St, Worcester Mass.

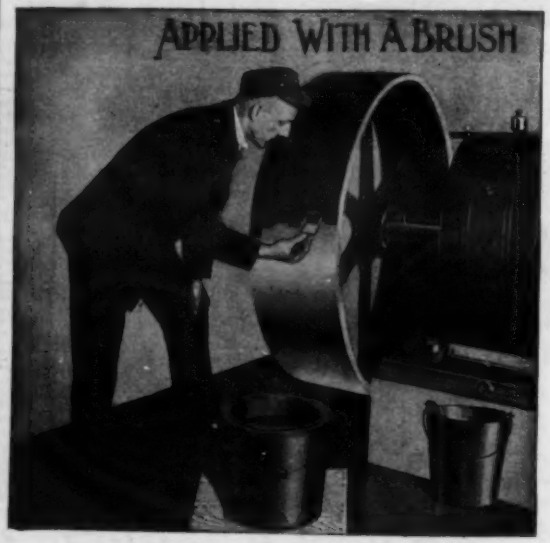
Carpet Machinery.
Altemus, W. W, & Son, 2816 N. 4th St, Phila, Pa.
Curtis & Marble Machine Co, Worcester, Ms.
Furbush, M. A, & Son, Machine Co, Phila, Pa.
Granger Foundry & Machine Co., Providence, R. I.
Howard, Geo. C., 1788 Barker St., Phila., Pa.

Cement "Dealers."
Warren Bros. Co., 143 Federal St., Boston.

Check System.
Foster, E. H. & Co., Cohoes, N. Y.

Chemicals and Apparatus.
Bullock & Crenshaw, 528 Arch St, Phila, Pa.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

Clutches.
American Tool & Machine Co., Boston, Mass.
Dodge Mfg. Co., Mishawaka, Ind.



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Worcester Warp Compressing Machine Co., Worcester, Mass.

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Warren Bros, Co., 143 Federal St., Boston.

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Jeffrey Manufacturing Co., Columbus, O.
Link Belt Machines Co., Chicago, Ill.

Copper (Perforated.)
See under Perforated Metal.

Copper Print Rollers.
Phillips Co, The Thomas, Providence, R. I.
Taunton New Bedford Copper Co, New Bedford, Mass.

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Butterworth, H. W. & Sons Co., Philadelphia.
Granger Foundry & Machine Co, Providence, R. I.
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American Bridge Co., New York.

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Stoddard, Haserick, Richards & Co., Boston.

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Buffalo Forge Co., Buffalo, N. Y.
Link Belt Machines Co., Chicago Ill.

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Altemus, W. W, & Son, 2816 N. 4th St, Phila. Pa.
American Loom Co., Readville, Mass.
Ashworth, Elijah, Fall River, Mass.
Atherton, A. T., Machine Co., Pawtucket, R. I.
Butterworth, H. W. & Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Mass.
Draper Company, Hopedale, Mass.
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Fairmount Machine Co, 22d and Wood Sts, Philadelphia.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kilburn, Lincoln & Co, Fall River, Mass.
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Lever, Oswald, Lehigh Ave. and Masher St., Philadelphia.
Lowell Machine Shop. Lowell, Mass.
Mason Machine Works, Taunton, Mass.
McKerrow, H. G & Co., Boston, Mass.
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Philadelphia Textile Machinery Co, Hancock and Somerset Sts, Philadelphia, Pa.
Phillips Co, The Thomas, Providence, R. I.
Ring Frame Thread Protector Co., The Amsterdam, N. Y.
Saco & Pettee Machine Shops, Newton Upper Falls, Mass.
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Stoddard, Haserick, Richards & Co, Boston, Mass.
Whitin Machine Wks, Whitinsville, Mass.
Woonsocket Machine & Press Co, Woonsocket, R. I.
Worcester Warp Compressing Machine Co., Worcester, Mass.

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Atherton, A. T., Machine Co., Pawtucket, R. I.
Howard & Bullough American Machine Co, Pawtucket, R. I.

Credits.
National Mercantile Agency, New York and Boston.

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Kennedy, Thos. (Cutters, etc.,) Cohoes, N. Y.

Decoration Wash for Interiors.
De Ronde, F S, Co., 54 John St., New York.
Moore, Benj. & Co., Brooklyn, N. Y.

Dextrine.
Stein, Hirsh & Co, 165 Duane St., New York.

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Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Brothers, Somerville, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Butterworth, H. W. & Sons Co., Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Kenyon, D. R. & Son., Raritan, N. J.
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Philadelphia Textile Machinery Co, Philadelphia, Pa.
Phillips Co, The Thomas, Providence, R. I
Rusden Machine Co., Warren, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Dusters.
See Wool and Waste Dusters.

Dyers, Bleachers and Finishers.
American Yarn Printing Works, 134-136 North 22d St., Philadelphia.
Brophy's, T, Sons, Jasper St, Philadelphia
Capstick, John & Sons, Montville, N. J.
Cohoes Dye Works, Cohoes, N. Y.
Cranston Worsted Mills (yarns), Bristol, R. I.
Davidson & Brooke, 2560 No. 3rd St., Philadelphia.
Duncan & Baillie, Cohoes, N. Y.
Firth & Foster Co, Kensington, Pa.
Greenwood, R. & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket and Valley Falls, R. I.
Littlewood, G. J., & Sons, Manayunk, Pa.
Lorimers, The Wm. H. & Sons Co., Phila.
Molt Bros., Millbury, Mass. (Indigo Blue.)
Pawtucket Dyeing & Bleaching Co, Pawtucket, R. I.
Philadelphia Linen Finishing Co., Frankfort, Philadelphia.
Pond Lily Co., New Haven, Ct.
Rowland, Samuel, Schuylkill Haven, Pa.
Warren, W, Thread Works, Westfield, Mass.

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Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Bros., Somerville, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Butterworth, H. W, & Sons Co Phila Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Delahunty Dyeing Machine Co., Pittston, Pa.
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Frank's Wagon Works, 2731 N. 6th St., Philadelphia.
Granger Foundry & Machine Co, Providence, R. I.
Hopkins, Machine Works, Bridgeton, R. I.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Kenyon, D. R. & Son, Raritan, N. J.
Knapp, C. H., Paterson, N. J.
Lincoln, The, Co, 54 Arch St, Hartford, Ct.
Parks & Woolson Machine Co., Springfield, Vt.
Phenix Iron Foundry, Providence, R. I.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia, Pa.
Philadelphia Textile Machinery Co, Hancock and Somerset Sts, Philadelphia, Pa.
Phillips, The Thomas Co, 91-95 South Main St, Providence, R. I.
Rusden Machine Co., Warren, R. I.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass. (Drying.)
Webendorfer & Walling, Paterson, N. J.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Dye House Cans.
Hill, James Mfg. Co., Providence, R. I.

Dyehouse Floors.
Warren Bros., 143 Federal St., Boston.

Dye Sticks,
Bailey, Frank, Cedar Brook, New Jersey.
Haedrich, E. M., Philadelphia, Pa.

Dyestuffs and Chemicals.
American Aniline Co., 163 No. Front St. Philadelphia.

Anchor Color Mfg. Co, 464 Cherry St, New York.
Atteaux, F. E. & Co., 174-176 Purchase St., Boston.
Berlin Aniline Works, 72 Front St., N. Y.
Bischoff, A Co, 87 Park Place, N. Y.
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Corey, S. J, 273 Congress St, Boston.
Dillon & Co, 20 Cedar St, New York.
Farbenfabriken of Elberfeld Co, 40 Stone St, N. Y.
Geisenheimer & Co, 189 Front St, New York.
Innis & Co, 3 Cedar St, New York.
Janney, O. S, & Co, Phila. and Boston.
Johnson, Chas. A, & Co, 22 Dey St, N. Y
Johnson, Wm. G, & Co, Uncasville, Conn.
Jones, J. Howell, 18 Burling Slip, New York.
Keller, John J, & Co, 104-106 Murray St, N. Y.
Klipstein, A, & Co, 122 Pearl St, N. Y.
Koechl, Victor, & Co, 122 Hudson St, N. Y.
Kuttroff, Pickhardt & Co., New York.
Matheson, W. J, & Co, 182-184 Front St, N.Y.
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N. Y. & Boston Dyewood Co, 55 Beekman St, New York.
Oakes Mfg. Co, 93 Pearl St, N. Y.
Roessler & Hasslacher Chemical Co, 100 William St., New York.
Schoellkopf, Hartford & Hanna Co., Philadelphia.
Sharpless Dye Wood Ext. Co, The Bourse, Phila, Pa.
Stamford Mfg. Co, 133-137 Front St., N. Y.
Sykes & Street, 85 Water St, N. Y.
Thayer, Ed. M., 106 Broad St., Boston, Mass.

Dynamos.
Sturtevant, Co., B. F. Boston.

Edgings.
See Tapes, Braids and Edgings.

Elastic Web Calendering Machines.
Knapp, C. H., Paterson, N. J.

Electrotyping and Printing.
Whitcomb, H. C, & Co, Boston.

Elevators.
Cohoes Foundry & Machine Co, Cohoes, N.Y.
Eastern Machinery Co, The, New Haven, Conn.
Jeffrey Manufacturing Co., Columbus, O.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Humphrey, S. K., 53 State St., Boston.

Electrical Construction.
Philadelphia Electric Construction Co., Philadelphia.

Electric Fans.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F., Boston.

Electric Motors.
Sturtevant Co., B. F., Boston.

Engine Foundations.
Warren Bros. Co., 143 Federal St., Boston.

Engineers, Mechanical.
American Bridge Co., The, New York.
Ferguson, John W, Paterson, N. J.
Rittenhouse, Frank, Norristown, Pa.

Exhaust Heads.
Burt Manufacturing Co., Akron, Ohio.

Fans—Exhaust and Ventilating.
See Ventilating Apparatus.

Feed Water Heaters.
Pendleton, Walter & Co., New York.

Feed Water Pumps.
Goulds Mfg. Co, Seneca Falls, N. Y.
Phœnix Iron Foundry, Providence, R. I.

Finishing Machinery.
See Dyeing, Drying, Bleaching and Finishing.

Fireproof Construction.
American Bridge Co., The, New York.

Fluted Rolls.
Cohoes Foundry & Machine Co, Cohoes, N.Y
Thurston, A. G, & Son, Box 528, Fall River. Mass.

Forges.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F., Boston.

Friction Clutches.
See Clutches.

Friction Hoisting Drums.
Eastern Machinery Co., New Haven, Conn.

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Hopkins, Machine Works, Bridgeton, R. I.
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Hunter Jas, Machine Co, No. Adams, Mass.
Kenyon, D. R. & Son, Raritan, N. J.

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Jones, Lewis, 60½ and Media Sts, Phila, Pa.

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Sturtevant Co., B. F., Boston.

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New Process Raw Hide Co., Syracuse, N. Y.

Gear Cutting Machine.
Whiton, The D. E, Co, New London, Conn.

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Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F., Boston.

Heating.
See Ventilating.

Heddles.
Watson, L. S, Mfg. Co, Leicester, Mass.

Hoisting Machinery.
The Eastern Machinery Co., New Haven, Conn.

Hose.
Boston Belting Co., Boston.

Hosiery Labels.
Decker, Foster Co., Philadelphia, Pa.

Hosiery Boards.
Pearson, J. T, Kensington, Pa.

Humidifying Apparatus.
American Air Moistening Co., Boston.

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American Tool & Machine Co., Boston.
Rusden Machine Co., Warren, R. I.
Webendorfer & Walling, Paterson, N. J.

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Cheney Bros, Silk Goods, 479 Broome St, N. Y.
Friedberger & Co, Edgings, Germantown Phila, Pa.
Fleming & Chapin, Philadelphia.
Hepner & Horwitz, Lacings, 30 Howard St, N. Y.
Kavanaugh, Geo. W., Cohoes, N. Y.
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Schneebeli, G. A. & Co., Nazareth, Penn.
Weimar Bros, 1817 East York St, Phila. Pa.

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Industrial Mfg. Co., Camden, N. J.
Merrow Machine Co, The, Hartford, Conn.
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Lindley, G. W., 5122 Wakefield St., Germantown, Pa.
Paxton & O'Neill, 129 Bread St, Phila, Pa.
Rittenhouse, Frank, Norristown, Pa.
Stafford & Holt, Little Falls, N. Y.

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American Knitting Machine Co., Woonsocket, R. I.
Beattie, Wm. & Son, Cohoes, N. Y.
Branson Machine Co., 506 John St., Philadelphia.
Campbell & Clute, Cohoes, N. Y.
Cooper, Chas, Bennington, Vt.
Crane Mfg. Co, Lakeport, N. H.
Excelsior Knitting Machine Manufacturing Co., Allentown, Pa.
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Jenckes, E. Mfg. Co, Pawtucket, R. I.
Jones, Lewis, 60 1-2 and Media Sts, Philadelphia, Pa.
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Leighton Machine Co, Manchester, N. H.
Lindley, Geo. W., 5122 Wakefield St., Germantown, Pa.

Mayo Knitting Machine & Needle Co, Franklin, N. H.
McMichael & Wildman Mfg. Co, Norristown, Pa.
Mueller, Arthur, 760 Lexington Avenue, Brooklyn, N. Y.
Nye & Tredick, 606 Arch St, Phila, Pa.
Paxton & O'Neill, 127 Bread St, Phila, Pa.
Pepper Mfg. Co, Lakeport, N. H.
Scott & Williams, 2079 E. Cumberland St., Phila., Pa.
Snyder, Homer P. Mfg. Co., Little Falls, N. Y.
Stafford & Holt, Little Falls, N. Y.
Taylor, James, 835 Arch St., Philadelphia.

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Breedon, Wm, & Son, Amsterdam, N. Y.
Cooper, Chas, Bennington, Vt.
Corey, Wm, Co, Manchester, N. H.
Crane Mfg. Co., Lakeport, N. H.
Dodge Needle Co., Manchester, N. H.
Ives, Loyal T, New Brunswick, N. J.
Kavanaugh, Geo. W., Cohoes, N. Y.
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Manufacturers' Supplies Co., 66 No. 4th St. Philadelphia.
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Page Needle Co , Chicopee Falls, Mass.
Treat, Orion, Manchester Green, Conn.
Wardwell Needle Co, Lakeport, N. H.

Laboratory Outfits.
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Draper Company, Hopedale, Mass.
Fairmount Machine Works, 22d and Wood Sts. Philadelphia.
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Mason Machine Works, Taunton, Mass.
Whitin Machine Works, Whitinsville, Ms,
Woonsocket Machine & Press Co, Woonsocket, R. I.

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Loom Picker Co., Biddeford, Me.

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Mails.
Walder, J, Paterson, N. J.

Mechanical Draft.
Boston Blower Co., Hyde Park, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F., Boston.

Measuring and Folding Machines.
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Fabric Measuring & Packaging Co., Postal Telegraph B'dg , New York.

Mercerizing Machinery.
Butterworth, H. W. & Sons, Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Rusden Machine Co., Warren, R. I.

Mill Brushes.
See Brushes.

Mills For Sale.
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Mill Builders and Engineers.
American Bridge Co., The, New York.
Ferguson, John W, Paterson, N. J.

Mill Supplies.
American Supply Co, Providence, R. I.
Bamford & Smith, Pascoag, R. I.
Bristol, The, Co., Waterbury, Conn.
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Jeffrey Manufacturing Co., Columbus, O.
Sweet & Doyle, Cohoes, N. Y.
Thurston, A. G, & Son, Fall River, Mass.
Watson, L. S, Mfg.Co, Leicester, Mass.

Napper Clothing.
Columbia Napper Clothing Co., 81 Holly St., Lawrence, Mass.

Napping Machines.
American Napping Machine Co, Williamstown, Mass.
Ardrey, S. B, & Sons, Bristol, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Jones, Lewis, 60, 1-2 and Media Sts., Philadelphia, Pa.

Neck Shaping Machine.
Eclipse Machine Co., Sanquoit, N. Y.

Noils (silk.)
Ryle, Wm. & Co., 54 Howard St., N. Y.
Malcolm Mills Co., Frankford, Pa.

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Bates Machine Co., 348 Broadway, New York.

Oil Filters.
Burt Manufacturing Co., Akron, Ohio.

Packing.
Boston Belting Co , Boston.
Jenkins Bros., New York.

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Moore, Benj. & Co, Brooklyn, N. Y.

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DeRonde, F. S. Co., 54 John St., New York.
Triumph Machine & Manufacturing Co. 209 Hester St , New York, N. Y.

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Siggers, E. G., Washington D. C.
Wolhaupter, D. P., Equitable Bldg., Washton, D. C.

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Warren Bros. Co., 143 Federal St., Boston.

Perforated Metal.
American Perforated Metal Co., 171 Wooster St., New York.
Beckley, A. J. & Co., Garwood, N. J.
Harrington & King Perforating Co., 230 North Union St , Chicago. Ill.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co., 100 William St, New York.

Picker Sticks.
Loom Picker Co., Biddeford, Me.

Picking, Carbonizing and Garnetting.
Garfield Woolen Co, Garfield, N. J.

Pipe Covering.
DeRonde, F. S. Co., 54 John St., New York.
Keasby, R. A. 83 Warren St, New York.

Pneumatic Conveying.
See Ventilating.

Power Transmitting Machinery.
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Christiana Machine Co., Christiana, Pa.
Dodge Mfg. Co , Mishawaka, Ind.
Eastern Machinery Co, New Haven, Conn.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jeffrey Manufacturing Co., Columbus, O.
Kilburn, Lincoln & Co. Fall River, Mass.
Link Belt Machinery Co, Chicago, Ill.
Rusden Machine Co., Warren, R. I.
Saginaw Manufacturing Co., Saginaw, Mich.

Preparatory Machinery, (Cotton).
Atherton, A. T., Mach. Co., Pawtucket, R. I.
Howard & Bullough Am. Machine Co., Pawtucket, R. I.

Presses.
Boomer & Boschet Press Co., 338 West Water St., Syracuse, N. Y.

Butterworth, H. W. & Sons Co., Philadelphia
Crawford, J. J, & Son, Nashua, N. H. (Power Screw, Hydraulic, Hollow Steam Plate.)
Curtis & Marble Machine Co, Worcester, Ms.
Fisher Mfg. Machine Co., Utica, N. Y. (For Knit Goods.)
Hart, Charles, Frankford, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Phillips Co, The Thomas, Providence, R. I.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Printers (Fabrics and Yarn.)
Capstick, John & Sons, Montville, N. J.
American Yarn Printing Works, Philadelphia.

Pulleys.
See Power Transmitting Machinery.

Pulley Covers.
Warren Mfg, Co., Chicago, Ill.

Pumps.
Goulds Mfg. Co, Seneca Falls, N. Y.
Rusden Machine Co., Warren, R. I.

Quills.
Parker, Henry Co, Springfield, Vt.

Raw Hide Gears.
New Process Raw Hide Co. Syracuse, N. Y.

Reed and Harness Manufacturers.
American Supply Co, Providence, R. I.
Loom Picker Co., Biddeford, Me.
Walder, J, Paterson, N. J.

Ribbons.
Cheney Bros, S. Manchester, Ct.

Ring Travellers.
National Ring Traveller Co., Providence, R. I.
Morley Button Mfg. Co., Boston.

Roofing Asphalt.
Warren Bros. Co., 143 Federal St., Boston.

Roofing, Gravel, Slag and Composition.
Eastern Granite Roofing Co., Jersey City N. J.

Roofing Materials (Manufacturers).
Warren Bros. Co., 143 Federal St., Boston.

Rope Transmission.
American Mfg. Co., New York.
Dodge Mfg. Co , Mishawaka, Ind.

Rove Traverse.
Rawlins, J H, Chester, Pa.

Roving Cans.
Hill, James Mfg. Co., Providence, R. I.
N. E. Ventilating & Heating Co, 930 Manton Ave. Providence, R. I.
Laminar Fibre Co., No. Cambridge, Mass.
Walrus Fibre Mfg. Co., Medford, Mass.

Rubber Covered Rollers and Goods.
Boston Belting Co., Boston.

Saddles and Stirrups.
Dixon Lubricating Saddle Co., Bristol, R. I.

Scales
Sweet & Doyle, Cohoes, N. Y.

Schools.
American Correspondence School of Textile, New Bedford, Mass.
Lowell Textile School, Lowell, Mass.
New Bedford Textile School.
Philadelphia Textile School, Phila, Pa.

Screens (Perforated.)
See under Perforated Metal.

Separators.
Ring Frame Thread Protector Co., The, Amsterdam, N. Y.
Draper Co , The, Hopedale, Mass.

Sewing Machines and Supplies.
Arlington Machine Works. (Arthur Birch), Arlington Heights, Mass.
Birch Bros., Somerville, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Excelsior Sewing Machine Co., Philadelphia.
Industrial Mfg. Co., Camden, N J.
Manufacturers' Supplies Co., 66 No. 4th St., Philadelphia.
Nye & Tredick, 606 Arch St, Phila, Pa.
Rusden Machine Co., Warren, R. I.
Scott & Williams, 6th and Arch Sts, Phila, Pa.
Union Button Sewing Mch. Co., 164 High St., Boston.
Wilcox & Gibbs S. M. Co., New York.

Shafting Hangers, Etc.
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Shearing Machinery.
See Dyeing, Drying, Bleaching and Finishing.

Shell Rolls.
Cohoes Foundry & Mach. Co, Cohoes, N. Y.
Thurston, A. G, & Son, Box 528, Fall River, Mass.

Shoddies.
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Shuttles.
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Silk Machinery.
Butterworth, H. W. Sons Co, Philadelphia.
Granger Foundry & Machine Co., Providence, R. I.
Knapp, C. H., Paterson, N. J.
Mason Machine Works, Taunton, Mass.
Rusden Machine Co., Warren, R. I.
Webendorfer & Walling, Paterson, N. J.

Singe Plates.
Butterworth, H. W. Sons Co., Philadelphia.
Taunton-New Bedford Copper Co., New Bedford, Mass.

Singeing Machines.
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Brothers, Somerville, Mass.
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Curtis & Marble Machine Co, Worcester, Ms.
Granger Foundry & Machine Co., Providence, R. I.
Knapp, C. H , Paterson, N. J.
Rusden Machine Co., Warren, R. I.

Sizing, Starch and Gums.
Stein, Hirsch & Co, 165 Duane St, New York.

Sky Lights.
Drouve, The G. Co., Bridgeport, Ct.

Slashers.
Cohoes Foundry & Machine Co, Cohoes, N. Y.
Lowell Machine Shop, Lowell, Mass.
Phillips The Thomas, Co., Providence, R.I.

Soaps.
India Alkali Works, Boston, Mass.

Spindles.
Bamford & Smith, Pascoag, R. I.
Buckley, Benj's, Sons, Gun Mill, Paterson, N. J.
Draper Company, Hopedale, Mass.
Easton-Burnham Co., Pawtucket, R. I.
Whitin Machine Wks, Whitinsville, Mass.

Spindle Tubes.
Bamford & Smith, Pascoag, R. I.

Spinning Cylinders.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Spinning Frames.
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Spinning Frames for Wool
Woonsocket Machine and Press Co., Woonsocket, R. I.

Spinning Rings.
Draper Company, Hopedale, Mass
Whitinsville Spinning Ring Co, Whitinsville, Mass.

Spinning Tubes.
Buckley, Benj's. Son, Gun Mill, Paterson, N. J.

Spools. *See Bobbins, Spools Shuttles, Etc.*

Sprinklers
International Sprinkler Co., Philadelphia, Pa.

Stamps for Hosiery.
Wells, Wilfred, 505 W. Lehigh Ave., Philadelphia.

Steam Boilers.
Babcock & Wilcox Co., The, 29 Cortland St., New York City.
Brown, C. H, & Co, Fitchburg, Mass.
Pendleton. Walter & Co., New York.

Steam Boiler Compound.
Straus & Co., 55 Broad St., New York.

Steam Boiler Insurance.
Hartford Steam Boiler Inspection & Insurance Co, Hartford, Conn.

Steam Engines.
American Blower Co , Detroit, Mich.
Brown, C. H, & Co, Fitchburg, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Hooven (The), Owens & Rentschler Co, Hamilton, O.
Pendleton. Walter & Co., New York.
Rusden Machine Co., Warren, R. I.

Sturtevant, B. F. & Co., Boston.

Steam Surface Coverings.
Kenney, Robert A., New York.

Steam Specialties.
Butterworth, H. W. Sons Co., Philadelphia.
Rusden Machine Co., Warren, R. I.
Jenkins Bros., New York.
Sturtevant Co., B F., Boston.

Steam Valves.
Jenkins Bros., New York.

Tanks, Tubs and Vats.
Caldwell Co., W. E. 202 Brook St., Louisville, Ky.
Cypress Lumber Co, Apalachicola, Fla.
Lewis, H. F. & Co., New O leans, La.
Rusden Machine Co. Warren, R. I.
Stearns, A. T, Lumber Co, Neponset, Mass.
Woolford, George, 2240 No 9th St, Phila, Pa.

Tapes, Braids and Edgings.
Cathcart, John, & Co, 115 Franklin St, N. Y.
Fleming & Chapin, Philadelphia.
Friedberger Mfg. Co, Germantown, Pa.
Krout & Fite Mfg. Co., Allegheny Ave. and Emerald St., Philadelphia.
Schneebeli, G. A. & Co., Nazareth, Pa.
Weimar Bros, 1817 East York St, Phila, Pa.

Telephones.
Mianus Electric Co., Mianus, Conn.
Philadelphia Electric Construction Co, Philadelphia.
Plummer, F. O. 620 Atlantic Ave., Boston.

Temples.
American Loom Co., Readville, Mass.
Draper Co., Hopedale, Mass.

Tentering Machines.
See Dyeing, Bleaching Machinery, Etc

Tension Pulleys.
Amelotema Oilless Bearing Co., Wayne, Junc., Phila. Pa.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Testing Machines.
Howard, Geo. C., 1783 Barker St., Phila., Pa.

Thread Protectors.
Ring Frame Tpread Protector Co., The, Amsterdam, N. Y.

Tom Tom.
Frank's Wagon Works, 2731 N. 6th St., Philadelphia.

Towers.
Caldwell Co., W. E. 202 Brook St., Louisville, Ky.

Trimmers.
Excelsior Sewing Machine Co., Philadelphia.

Turbines.
(See Water Wheels.)

Valves—Rubber.
Boston Belting Co., Boston, Mass

Ventilating Apparatus.
Allington & Curtis Mfg. Co., Saginaw, Mich., 81 Wareham St., Boston.
American Air Moistening Co., Boston.
American Blower Co., Detroit, Mich.
Berry, A. Hun, 23 W. 1st St, Boston, Mass.
Boston Belting Co., Hyde Park, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Drouve, The G. Co., Bridgeport, Ct.
Mattern, Geo. 44 East 8th St., New York.
National Pancoast Ventilator Co., Philadelphia, Pa.
New England Ventilating & Heating Co, Providence. R. I.
New York Blower Co., New York.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philapelphia.
Philadelphia Textile Machinery Co, Hancock St, above Lehigh Ave, Phila, Pa.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass

Wall Whitening.
DeRonde, F. S. Co, 54 John St, New York City.
Moore, Benj. & Co, Brooklyn, N. Y.

Warp Stop Motions.
Am. Loom Co., Readville, Mass.
Draper Co., Hopedale, Mass.

Washers (Cloth).
Arlington Machine Works, (Arthur Birch), Arlington Heights, Mass.
Birch Brothers, Somerville, Mass.
Butterworth, H. W. & Sons Co., Philadelphia.
Hopkins, Machine Works, Bridgeton, R. I.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Phillips Co, The Thomas, Providence, R. I.
Rusden Machine Co , Warren, R. I.
Webendorfer & Walling, Paterson, N. J.

Watchman's Clocks.
Am. Watchman's Time Detector Co., Broadway, N. Y.
Eco Magneto Clock Co, 620 Atlantic Ave, Boston.
Nanz & Co, 127 Duane St., New York.
Philadelphia Electric Construction Co., 1313 Chestnut St., Philadelphia.

Waterproof Floors.
Warren Bros. Co., 143 Federal St., Boston.

Water Wheels.
Bradway, C. P., W. Stafford, Ct.
Christiana Machine Co., Christiana, Pa.
Hunt, Rodney, Machine Co, Orange, Mass.
Leffel, James, & Co, Springfield, O.

Water Wheel Governors.
Bradway, C. P., West Stafford, Ct.
Cohoes Foundry & Machine Co, Cohoes, N. Y.
Leffel, James & Co, Springfield, Ohio.

Winders. (Back.)
Taylor, Jas., 835 Arch St., Philadelphia.

Winder Bobbins.
Sweet & Doyle, Cohoes, N. Y.

Winders. (Hosiery.)
Lever, Oswald, Lehigh Ave. and Mascher St., Philadelphia.
Universal Winding Co, 95 South Street, Boston.

Wood Pulleys.
Dodge Mfg. Co., Mishawaka, Ind.
Saginaw Manufacturing Co, Saginaw, Mich.

Wool Cleaning Compound.
India Alkali Works, Boston.

Wool Combing Machinery.
Crompton & Knowles Loom Works, Worcester, Mass.
Leigh, Evan A. 35 Mason Bldg., Boston.
Stoddard, Haserick, Richards Co., Boston

Wool Extracts.
Garfield Woolen Co, Garfield, N. J.

Wool Scouring.
Philadelphia Wool Scouring & Carbonizing Co., Philadelphia, Pa.

Wool and Waste Dusters.
Atlas Foundry and Mch. Co., Newark, N. J.
Gerry, Geo. & Son, Athol, Mass.
Sargents', C. G., Sons, Graniteville, Mass.

Woolen and Worsted Machinery.
Altemus, W. W. & Co, 2816 N. 4th St, Phila. Pa.
American Tool and Machine Co., Boston.
Arlington Mch. Works (Arthur Birch), Arlington Heights, Mass.
Atlas Foundry and Mch Wks., Newark, N.J.
Birch Brothers, Somerville, Mass.
Butterworth, H. W. Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Furbush, M. A. & Son Machine Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jefferson, Ed. & Bro, 28 Strawberry St, Phila, Pa.
Kenyon D. R. & Son, Raritan, N. J.
Leigh, Evan A. 35 Mason Bldg, Boston.
Lever, Oswald, Lehigh Ave. and Mascher St., Philadelphia, Pa.
Parks & Woolson Machine Co., Springfield, Vt.
Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Philadelphia.
Phillips Co. The Thomas, Providence, R. I.
Rusden Machine Co., Warren, R. I.
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Schofield, Geo. L., Philadelphia.

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Warren, W, Thread Works, Westfield, Mass.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Tucker & Cook Mfg. Co, Conway, Mass.
Whittier Cotton Mills, Lowell, Mass.

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American Cotton Yarn Exchange, 67 Chauncy St., Boston.
Catlin & Co. New York and Boston.
Colchester Mills, 346 Broadway, New York.
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Dexter Yarn Co., Pawtucket, R. I.
Eddy & Street, Providence, R. I.
Spring St., N. Y.
Eichmann & Sternberg, New York.
Germantown Spinning Co, Germantown Pa.
Grant Yarn Co, Fitchburg, Mass.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Indian Orchard Co., Indian Orchard, Mass.
Jenckes, E., Mfg. Co., Pawtucket, R. I.
Mitchell, Jas. E, & Co, Boston and Phila, Pa.
Montgomery, J. R, Co, Windsor Locks, Ct.
Monument Mills, Housatonic, Mass.
New England Cotton Yarn Co, New Bedford, Mass.
Orswell Mills, Fitchburg, Mass.
Tucker & Cook Mfg. Co, Conway, Mass.
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Fawcett, Hughes, 115 Franklin St., N. Y

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Greene & Daniels Mfg. Co, Pawtucket, R. I.
New England Cotton Yarn Co, New Bedford, Mass.

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Lorimers, Wm. H. & Sons Co., Philadelphia.
Malcolm Mills Co, Frankford, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Harness Twines.

Cranston Worsted Mills, Bristol, R. I.
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Moore, C., & Co., (S. W. cor. 5th and Market Sts.)
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Hosiery and Knitting Yarns.

Boyer, B. F, & Co, Camden, N. J.
Campbell, Geo, & Co, Phila, Pa.
Colchester Mills, 346 Broadway, New York.
Cranston Worsted Mills, Bristol, R. I.
Dexter Yarn Co., Pawtucket, R. I.
Germantown Spinning Co, Germantown, Pa.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Jenckes, E., Manufacturing Co, Pawtucket, R. I.
Mitchell, James E, & Co, Phila. and Boston
Monument Mills, Housatonic, Mass.
New England Cotton Yarn Co., New Bedford, Mass.
Orswell Mills, Fitchburg, Mass.
Skerry, A T, & Co, 47 Leonard St, N. Y.
Walcott & Campbell Spinning Co, New York Mills, Oneida Co. N. Y.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass
Wolstenholme & Clark, Baker and Mallory Sts., Manayunk, Pa.

Mercerized Yarns.

Indian Orchard Co., Indian Orchard, Mass.
Lorimer, Wm. H. & Sons Co, Philadelphia.
Montgomery, J. R. & Co., Windsor Locks, Conn.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.

Waverly Worsted Co, Main St. and Green Lane Manayunk, Pa.
Wolstenholme & Clark, Baker and Mallory Sts., Manayunk, Pa.

Mohair Yarns.

Cranston Worsted Mills, Bristol, R. I.
Goff, D. & Sons, Pawtucket, R. I.
Skerry, A. T, & Co., 47 Leonard St., N.Y.

Novelty Yarns, Tinsels, Silk Noils, Etc.

Cranston Worsted Mills, Bristol, R. I
Indian Orchard Co., Indian Orchard, Mass.
Malcolm Mills Co, 229 Chestnut St, Phila, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

Silk Yarns.

Cheney Bros, S. Manchester and Hartford Ct.
Eddy & Street, Providence, R. I.
Magid Hope Silk Mfg. Co., Milford, Mass.
Ryle, Wm, & Co, 54 Howard St, N. Y.

Woolen and Merino Yarns.

Boyer, B. F, & Co, Camden, N. J.
Eddy & Street, Providence, R. I.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Jenckes, E. Mfg. Co., Pawtucket, R. I.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.

Worsted Yarns.

Alleghany Worsted Mills, Phila, Pa.
Boyer, B. F, & Co, Camden, N. J.
Campbell, Geo. & Co, Phila, Pa
Campion, Richard, 17 Bank St., Philadelphia.
Cranston Worsted Mills, Bristol, R. I.
Croft, Howland, & Sons, cor. Broadway and Jefferson Ave., Camden, N. J.
Goff, D. & Sons, Pawtucket, R. I.
Herbst & Jones, 21st and Naudain Sts, Philadelphia, Pa.
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880 **Supt. or Assistant Supt. and Designer.** Over 25 years' experience as supt. and designer. Has designed and manufactured nearly all classes of goods made in a woolen mill, in wool and worsted, such as shawls, blankets, beavers, kerseys, cheviots, fancy cassimeres, overcoatings, worsted suitings, etc. 58 years old; married, with family. Would go West or nearly anywhere. Wants a mill where he can permanently settle and give them the benefit of his experience as a manufacturer. A first-class man.

1683 **Woolen Supt.** Large experience. Last mill where he was employed was for five years overseer and 15 as superintendent. A good man on flannels, sackings, skirtings, woolen dress goods and domestic woolen goods. Well up in weaving, dyeing, carding, etc., and has a general knowledge of all departments in a Western woolen mill. Englishman; married. Refers to past employers.

1796 **Supt. of Worsted Mill.** Age 35; English; married. Would take position as overseer of spinning. Has had six years' experience in a mill as overseer of spinning, drawing, combing, scouring and sorting, also twisting, doubling, skein winding and dresser spooling.

1537 **Woolen Superintendent, Designer or Weaver.** Has worked on all classes of woolens, worsteds, cotton worsteds, fancy cassimeres, etc., and is acquainted with all Eastern makes of machinery. American. Age 34; married.

1768 **Supt. and Designer** in a worsted or woolen mill. Prefers worsted mill. Now employed as designer and assistant supt., but is competent to take charge of a mill. Is familiar with all makes of machinery, and has manufactured nearly all classes of goods. Will not change for less than $2,000 a year. Excellent references.

1398 **Woolen Superintendent or Designer** of recognized ability and at present employed as a superintendent of 36 set woolen and worsted mill. He finds it necessary to remove from New Jersey on account of his wife's health. His past record is first-class and this is an unusual opportunity to secure the services of a first-class superintendent.

1575 **Assistant Supt. Woolen.** A graduate of the Philadelphia Textile School (highest standing), and has had more than 7 years' experience in the various departments of a Massachusetts mill. Wants to get a start where there is fair chance of advancement. Age 28, single.

COTTON SUPERINTENDENTS.

1686 **Cotton Supt.** Age 53; American; married. Large experience. Been in present position as superintendent for a number of years and previously in the same mill as overseer of weaving. Nearly all kinds of goods. Is familiar with nearly all makes of machinery. Refers to past employers.

1689 **Supt. or Assistant Supt.** Age 37; American; married. Large experience as overseer and first-class references. At present employed as overseer, but is capable of filling a superintendent's position. Worked on prints, twills, sheetings, cambric and fancies.

1673 **Cotton Supt., Carder, and Spinner.** Age 23; English; single. Large experience in English mills. Can take position at once. Has worked on all kinds of cotton machinery.

1806 **Supt. of a Cotton Weaving Mill,** colored or white, 5,000 to 10,000 spindles; or overseer of weaving in a cotton mill, on any kind of work and any size mill, white or colored. Will go East, West, North or South, Canada or Mexico. Has had good and long experience. A married man; 40 years old, strictly temperate. Can give references as to ability and character.

189 **Cotton Superintendent** wants position in Northern mill. Has been in charge of Southern mills for 7 years. Previous experience in N. E. Is well known among mill men, and can furnish the best of references. Age 35; married.

1772 **Supt. or Overseer of Weaving.** Age 38; American; married. Lawns, fine sheetings and shirtings, sateens, twills, fancies, denims and cottonades. Is familiar with Whitin, Lowell, Draper, Northrop and English machinery. Not at present employed.

1306 Young American wants position as cotton superintendent. Experience mostly on cotton warps. Has been bookkeeper, overseer of carding and spinning; also superintendent in Massachusetts mills.

1532 **Superintendent.** Has been in mill business all his life, and been with the present firm for a number of years, having been promoted several times. He wishes to better himself.

WOOLEN CARDERS.

1696 **Carder,** or secondhand. Experienced on cassimeres, cloakings, blankets, shawls, jeans, and is familiar with Furbush, Bridesburg and Smith cards. Wants position in Western or Southern States. Can take place immediately. Age 30; American; single.

1798 **Boss Carder,** or carder and spinner. Age 49; English. Large experience on fine, medium and coarse wool, also wool, cotton and shoddy mixes, cassimeres, flannels, blankets, kerseys, meltons, beavers, government goods, etc. Excellent references and first class man in every respect. Was nine years boss carder in England and has held good positions in this country as boss carder and spinner.

1707 **Overseer of Carding.** Worked for 21 years in a woolen mill as boss carder, but through sickness was obliged to resign his position. Is now ready and wants a situation at once. Age 49; American; married. Wants $3 a day. Has worked on dress goods and flannels.

1801 **Overseer of Carding.** Age 27; German; married. Dress goods, knit goods, wool and cotton mixes, blankets and paper makers' felts. Is familiar with all kinds of American machinery. Wants $3.00 per day.

1799 **Boss Carder.** Age 32; American; married. Has worked on beavers, kerseys, chinchillas, cloakings and suitings. Is familiar with Davis & Furber, Cleveland and Furbush machinery. Wants not less than $2 50 per day. Excellent references.

1270 **Boss Carder** (and spinner, if desired) in an underwear or hosiery mill. Fine and heavy wool and cotton. German; age 34. First-class man in every respect. Excellent references.

1147 **Overseer of Woolen Carding,** Age 45; married. Has worked on almost every kind of goods made in a woolen mill. Refers to former employers. Wants $3.00 a day.

COTTON CARDERS.

1736 **Overseer Cotton Card Room** and Combing. Age 39; married. Has been overseer for past nine years. In last position seven years. Started up two large rooms with combers in each. Thoroughly understands all machinery in card room, and has run all grades of cotton. Can furnish references, if required.

1751 **Carder and Spinner.** Can give first-class references as to character and ability. Has had twenty-one years' experience as overseer on both American and English systems of carding. An American; 45 years old. Has worked on fine and coarse, also colored cotton.

1320 **Boss Cotton Carder.** Has been overseer for 12 years Is at present employed, but desires to change for good reasons Would accept $2 50 a day. Age 40; American, married.

1782 **Overseer Cotton Carding.** Age 25; single. Fine carded and combed cotton yarns. Is familiar with all makes of machinery. Wants $3.50 per day.

WOOLEN SPINNERS.

1429 **Cotton Ring Spinner** who has been overseer 5 years and second hand 8 years. Worked on white and colored yarns, spooled and twisted. Refers to past employers in Maine and Mass. Age 36. Married.

1784 **Worsted Drawer and Spinner.** Would take twisting. Age 2-; English; single. Can furnish references as to ability and character.

633 **Woolen Mule Spinner** desires to move from Maine on account of wife's health. At present in good position. Age 37; married, Scotchman.

1691 **Boss Spinner** Large experience in first-class N. E. mills on flannels and all kinds of fancy cassimeres. Englishman; age 50; married. Refers to past employers.

1543 **Woolen Spinner and Carder.** Has handled both departments together and separately. Will go South or West. Age 29; single.

1601 **Woolen Spinner,** or painter and glazer in any kind of mill. Age 31; Irish; married. Wants $10 50 per week. Has worked on cheviots, overcoatings, broadcloths, satinets, hosiery, yarns, etc.

1519 **Overseer of Woolen Spinning.** Age 31; married. Has worked on yarns from 1 run down to 5½. Some experience on shoddy. Will work for moderate salary.

COTTON SPINNERS.

1364 **Mules or Frames.** 34 years old; married. Thoroughly understands all makes of English and Mason mules. Has set up machinery and been expert fixer. Wants good position as overseer of mule room, or would take charge of frames. Accept $3.50 per day. Best references.

1663 **Overseer Mule Room.** Eleven years' experience in Fall River mills, and for the past ten years overseer of mule room. Excellent reference from present employer. Age 44, married.

1698 **Overseer of Mules.** 34 years old; married; English. 10 years' experience, chiefly on English mules, on all grades of cotton yarn. Would like to get a large job.

1703 **Overseer Ring Spinning, Warping and Spooling.** Is experienced on white work from Nos. 4's to 30's. Is familiar with Whitin and Lowell Machine Shop spinning frames and spoolers and warpers. Wants $3 per day to start with. Age 39; American; married.

1690 **Cotton Mule Spinner.** Age 42; French; married. Has worked on prints and sheetings and on yarns from 9's to 50's. First class references. Two years' experience as secondhand and five as overseer. Wants $2.50 per day to start with.

1576 **Competent Overseer, Spinning,** spooling, warping, twisting, desires a situation at once. 10 years' experience as overseer on fine and coarse yarns used for ginghams, shirtings, sheetings, drills, bags, linings, twines and cordage. Unquestionable references from former employers as to character and ability to obtain largest production at lowest cost and maintain quality. Would superintend small twine or cordage mill.

1592 **Overseer Cotton Ring Spinning.** Has worked his way up from back boy to second-hand in large N. E. mill, and has recommendations showing him to be capable of handling a room. American; age 40, married Would require two weeks' notice Will start at $3 a day.

WOOLEN WEAVERS.

1645 **Overseer Weaving.** Age 30; married, American. Has worked in weave room since he was 17 years old, as weaver, fixer and secondhand of weaving, except for a short time was traveling salesman. Has worked on ladies' dress goods, men's fine worsted suitings, overcoatings, cloakings, etc., on Crompton & Knowles and Jacquard looms. Excellent references.

1712 **Second-Hand or Overseer of** Weaving. Age 29; American; single. Has some knowledge of designing. Has worked on fancy worsteds, cassimeres and cheviots. Wants $2.50 per day to start with. Is familiar with Crompton & Knowles machines.

1688 **Overseer of Weaving** in large mill, designer in small mill, or assistant designer in a large mill. Age 38; German; single. Has worked on beavers, chinchillas, fine cassimeres, fine fancy worsteds, ladies' dress goods, army goods, union cassimeres and other classes of goods. Strictly temperate and industrious.

1536 **Boss Weaver or Superintendent.** Age 43; married; American. Can run any department in woolen mill, having been in business for himself. Not at present employed. Can take position immediately.

1468 **First-Class Weaver** on fancy woolens, worsteds and meltons, cotton worsteds and shoddy goods. Can take overseer position after 6 days' notice. Has been loom fixer, boss and superintendent. Age 43. Crompton & Knowles looms.

1805 **Boss Weaver.** Has worked on fancy dress goods, cashmeres, ginghams, fancy worsteds, coatings, lenos and Jacquards. Has also some knowledge of designing. Wants $4.00 per day. English; age 36.

COTTON WEAVERS.

1783 **Secondhand or Overseer** of cotton weaving, or assistant designer. Age 25; American; single. Just completing two year course in both designing and weaving. Is a practical loom fixer of three years' experience.

1811 **Overseer of Weaving,** or second hand in large room. Fixed looms for six years in Jacquard shop and has had 18 years' experience as overseer. Has worked on print goods, sheetings, bed ticking, ducks and drills. Age 47; American; widower.

1738 **Overseer of Weaving. Drawing-in,** Warping, Slashing and all preparations. 14 years' experience in colored mill in Manchester, Eng., and two years in this country. Age 37; English; married. Has worked on sateens, drills, dress goods, zephyrs, turkish towels, and can pick out own pattern for weaving and drawing-in. Understands the different makes of looms. Wants $3.00 per day.

1459 **Fancy Cotton Weaving,** Slashing, etc. Age 38; married. Has worked on all kinds of fancy goods and is thoroughly competent in all departments of manufacturing, with the exception of spinning. Understands velvet and corduroy weaving. Is not at present employed and can take a position immediately.

1668 **Overseer of Weaving.** Age 41; English; married. Has had large experience as loom fixer and secondhand of weaving, and is competent to take an overseer's job. Has worked on shirtings, sheetings, sateens, fancy lenos, and all grades of fine goods all the way from 2 to 25 harness.

1425 **Overseer, Cotton Weaving.** Age 38. Married. At present employed in large Mass. mill where he has been for 7 years as overseer. Worked on all kinds of goods and is well experienced. American. Refers to past and present employers.

KNITTERS.

1812 **Boss Knitter** on latch needles, or sewing machine fixer. Age 35; American; married. Has had 12 years' experience, and can handle any kind of latch needles. Excellent references as to character and ability.

1815 **Master Mechanic.** 31 years of age; married; American. Has worked in cotton mills for the past 16 years. Wants to change on account of unhealthy locality. Can furnish excellent references.

1780 **Boss Knitter** on flat or fleece-lined underwear and fancy overshirts. Age 33; Canadian. Is familiar with all makes of circular spring needle machines, also all rib machines in spring or latch needle, also understands sewing machines, loopers, etc. Al references.

1777 **Overseer of Knitting.** Has worked on ladies' and infants' underwear. Standard makes of machines. Wants $21 per week. Age 33; English. Refers to past employers.

1492 **Boss Knitter.** Age 27; single; American. Worked in New York State mills. Is familiar with Campbell & Clute, Tompkins, McMichael & Wildman, Scott & Williams, Nye & Tredick machinery. Single and double plush work, balbriggan, etc.

DYERS.

1733 **Dyer.** Age 33; married; a Scotchman. Worked in Scotland, and has been over seven years in this country as secondhand for a large manufacturing concern, with whom he is at present, but desires to change to a position where he will have full charge. Has handled cotton yarn from 10's to 80's in warp and skein, also experienced on worsted and silk yarns. Can furnish references as to character and ability.

1644 **Overseer Aniline Black and Turkey Red Dyer.** Has had ten years' experience as secondhand in mill where he now is, but wishes to change to better himself. Can take a position at once. Has worked on sateens, cambrics and linings of all kinds. Age 24; English, single.

1809 **Boss Dyer.** Age 33; American. Wants $3.50 per day or more. Wants to change on account of locality. Has worked on fancy cotton yarns, mohair novelty yarns, worsted yarns, raw cotton, raw wool, piece dyes on flannel, mixed cotton and wool and all wool, kerseys and beavers and beavers with cotton warp.

1664 **Boss Dyer.** Age 40; Scotch, married. 14 years' experience as boss dyer. 20 years in all at trade. Has worked on wool, cotton, ramie, worsted, shoddy and union waste dyeing for overcoatings, linings, tweeds, cassimeres, plaids, flannels, and ladies' wear, also on all wool and union piece dyes, hosiery, knit goods, yarns, slubbing. Is practically familiar with scouring, bleaching, carbonizing, speck dyeing and mill soap making.

1778 **Dyer of Wool, Felt,** etc. Age 25; American; married. Refers to past employers.

1781 **Boss Dyer and Finisher.** Age 20; Scotch; single. All wool and cotton mixed blankets, fine and coarse flannel. Some cassimeres and shoddy goods. Refers to past employers.

1714 **Cotton Yarn Dyer.** Age 36; Scotch; married. Has had 15 years' experience on fast shades. Wants $4.00 to start.

FINISHERS.

1792 **Boss Finisher,** with over 20 years' experience on all kinds of woolen and worsted goods. Learned business in one of the best woolen mills in Scotland and has also had experience in some very good mills in this country. Strictly temperate and steady, and can give good references as to character and ability. Wants position in a good, steady-running mill at once. Age 38 years; married.

1692 **Cotton Finisher and Corduroy** Cutter. Age 31; English; married. Large experience in England and in this country. All classes of corduroys and velvets, cutting, etc., singeing and finishing of cords. Can furnish excellent references.

1808 **Boss Finisher.** Has worked on worsteds, cassimeres, blankets, overcoatings, cloakings, flannels, dress goods, satinet, unions and beavers, and is familiar with most all makes of machinery. Age 39; American; married. Has had a large experience, and can furnish most excellent references from past employers.

1814 Is 29 years of age and married. Has had ten years' experience on hosiery of all kinds and nearly all makes of machines. Will take position as either superintendent or boss knitter.

1804 **Overseer of Finishing.** Wants to change on account of town he is in. Is familiar with all kinds of woolen and worsted machinery, and has worked on kerseys, cassimeres, carriage cloth, worsteds, dress goods, shawls, etc. Age 35; American; married. Wants $4.00 per day. Excellent references from past employers.

DESIGNERS.

1789 **Designer,** or assistant supt. and designer. An Al color designer. Can get up good line of fancy woolen and worsted goods which will be good sellers and profitable to the manufacturer. Graduate of a prominent designing and textile school in Germany. Is well posted on all kinds of stock, cotton and shoddy, and with the general work of a woolen mill.

1773 **Asst. Designer.** Age 22; English; single. Fancy worsted, cotton and silk mixed dress goods; serges, shoetops and some double cloths.

1672 **Designer, Overseer of Weaving,** or assistant supt. Age 26; English; single. Has worked in various mills in England and this country. Holds first honors diploma for weaving and designing (London City Guilds). Fancy worsteds, dress goods, colored and fancy cotton goods.

1721 **Asst. Supt. or Designer.** Age 27; American; single. Has worked on all classes of colored cotton goods, plain and fancy, and gray goods. Wants $1200 per year, and can take position immediately.

MISCELLANEOUS.

1735 **Boss Calenderman.** Age 39; English. Is familiar with all kinds of machinery used in bleachery, and has worked on sateens, silesia, cambric, shirtings, sheetings, etc. Wants $3.00 a day. Can furnish references.

1744 **Fixer.** Age 24; American; single. Is familiar with Boss, Invincible, McMichael & Wildman, Brinton, Denny and Victor machines. Wants $15 a week.

1813 **Overseer of Knitting Finishing Room.** Has had seventeen years experience in knitting mills, and understands finishing flat and ribbed goods, sweaters, overshirts and ladies' and children's flat and ribbed underwear. Was ten years with one firm. 35 years of age; single. Can furnish references.

1810 **Dresser Tender.** Age 23; German, single. Is familiar with Davis & Furber and Cleveland dressers. Will not change for less than 20 cts. per hour.

1746 **Overseer Warping and Dressing,** or weaving, warping and dressing. Has worked on woolens and fancy worsteds. Is familiar with Davis & Furber dressers; Draper, Phenix and Lowell Machine Shop warpers; English plain and Crompton looms. Wants $3 a day.

1762 **Chemist.** Age 23; American. Wants a position in dye works, print works or bleachery. $15 a week to start on. Excellent references.

1764 **Engineer and General Repair Man.** Age 45; American; married. Wants $2.50 to $3.00 a day. Over twenty years' experience.

1765 **Overseer Colored Cloth Room.** Age 48; American. 25 years' experience as secondhand.

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Who thoroughly understands the finishing and putting-up of fine cotton piece-goods, etc. Must be first-class man of good executive ability, in addition to being a practical finisher; **competent to take full charge of an important establishment.** All applications containing full particulars and references received between now and January 1st will be considered.

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We have now a number of excellent points for new Cotton Mills, or for Knitting Mills, where local capital will join with that from the North in new enterprises. If you are interested, write us.

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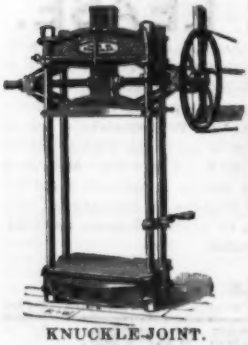

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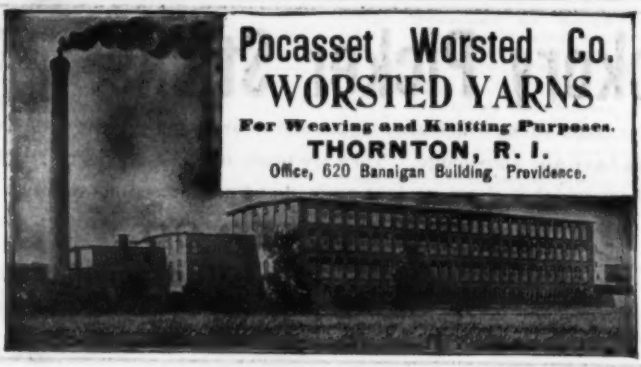

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Mohair and Worsted

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Mohair Plushes,

Worsted and Cotton Braids.

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ESTABLISHED 1861.

YARN DEPARTMENT.

The Yarn Market.

Cotton Yarn: The deadlock in which high priced cotton and low priced goods have kept the market for some time, still continues. Yarn is very firm in sympathy with the raw material. The knitter and weaver can get no concession in price from the spinner, and yet such concession is necessary if a loss is to be avoided in the weaving and knitting mills. The consumer is in these lines of goods as in all others, the final arbiter. He has just so much money to spend, and if clothing rises in price, he gets along with less of it. For this reason, the knitters and weavers find it impossible to secure an advance and they in turn restrict their purchasers of yarn to actual needs. The result is a restricted business. The prospect being good for a continuance of 10 per cent cotton, it is unlikely that prices for yarn will fall. As long as the consumer declines to pay more for his goods, the knitters and weavers have to choose between idle machinery or adulteration of the goods. Time will equalize present conditions, and the trade can do nothing but wait.

The Eastern list price for mule yarn, is about as follows;

10s	18¾ to 19¼
14s	19¾ to 20¼
18s	21 to 22
20s	21¼ to 22¼
Warps (single):—	
20s	17½ to 18
22s	18 to 18¼
16s	17
14s	16 to 16¼
Warps (two ply):—	
1 is	17½ to 18
20s	18 to 18½
30s	21 to 22
40s	25 to 27
Skein:—	
8s to 10s single	15½ to 16
12s and 14s	16 to 16½
16s	16½ to 17
20s	17¼ to 18½
22s	18 to 19
8/3	14¼ to 15
14/2	16 to 16¼
20/2	18¼
30/2	21 to 21½
40/2	28 to 30

Woolen Yarn: Spinners are running out of old orders, and are now looking for contracts to carry them along the coming year. Many of these contracts are pending, awaiting the opening of the coming year's business; buyers claim that the unseasonable weather is largely responsible for the backward business.

The coming season promises well, and all indications point to good steady business. Orders will be conservatively placed, and speculation which has cost mills and merchants so much loss will be out of style.

Weavers are making inquiries for yarn to be used in heavy weights both for backing, filling and warp, but will not place orders this season until they have orders in hand for the cloth. Last year's yarn orders were placed early only to be cancelled later in the season. When orders for the cloth did not materialize; and this early ordering and then cancelling cost spinners much money as they covered for the material to make the yarn ordered, and many are now carrying stock ordered at that time.

The prospective buyers state that an attempt may be made to advance prices, but that such an attempt will prove a "boomerang" to the spinners as purchasers of cloth will not be stampeded the coming season, but will, if prices are advanced, swing off on to cotton worsteds and cotton back worsted.

The hosiery knitters will begin to place orders for samples, and will place orders—yarn to be delivered in April and May. Hosiery manufacturers will not place many orders before February and March, and will at that time place quite a number of orders for woolen and merino yarn.

There is not, however, so much woolen yarn being used for hosiery as was the case in times past, as many of the mills that used good quantities of woolen yarn are now running on French spun worsted yarn; but this may change at any time, as it is wholly a whim of style.

The placing of orders by mills early in the season for delivery in May and June, is quite a proposition to some of the spinners, as they have to buy the material at the time the order is placed, and carry until the deliveries are agreed upon; the spinner not only takes a chance of the market declin-

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Germantown Spinning Co.

COTTON CARDED

HOSIERY YARNS

In numbers from 6s to 26s.

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SPOOL COTTON

on 100 to 12,000 yd. Spools or Tubes.

A Specialty of Thread for Manufacturers Use

on Spools, Tubes or Bobbins.

Also Seaming and Hosiery Yarns

on Cones, Tubes or Skein.

Our bleaching and dyeing facilities are new and unsurpassed for prompt and neat work. Correspondence solicited.

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COMBED AND CARDED COTTON YARNS

From Northern and Southern Mills.

American, Egyptian, Peruvian and Sea Islands.

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Knitting and Weaving Yarns

Cones, Cops, Warps, Skeins,
Single, Double, Three-ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.

EDWARD S. HYDE, 223 and 225 Chestnut Street, **Philadelphia, Pa.**

ing on his material, but he must take the chance of a cancellation from the buyer. Taking all in all, it is a most one-sided and risky business for the spinner.

The knitters of underwear are all short of material, and will place orders after December 15th, as before that time it is between seasons, and manufacturers generally prefer to let matters remain open until that time, as they will have a much better idea of what their requirements are to be. They are all watching the wool market, and if there is any tendency for an advance they would buy before that time.

There is a good demand for fine thread waste, and mills will find a great shortage not only here, but in Europe. It is reported that in consequence of a very strong demand for thread waste and noils, and because of the fact that we have a much reduced production of noils and wastes of all kinds, that prices not only will be higher, but these qualities will be difficult to secure at any price, and the wise buyer will place his order early.

The worst of bad business is over—the trouble has been that all the manufacturers purchased all the wool they needed for a year at one time. As a prominent salesman declared; "I sold on one trip 3000 bags scoured wool, but after that trip and for six months I did not sell enough wool to pay for the cigars I smoked, let alone paying traveling expenses."

The failures in the wool trade were what was expected, resulting almost wholly from speculation; had the speculation been a success, it would have been called something different.

The trade in general have much sympathy for Fred Hartley, who has been very successful in his business to the present unfortunate deal. His wool is now in strong hands and

DEXTER YARN CO.

Cotton Yarns in Cops, Cones and Skeins; on Beams or Spools, Single and Twisted. Cable Cords and Twines.

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Commission Merchants.

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Cotton, Woolen & Worsted Yarns.

All numbers on Hand and Made to Order.

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MANUFACTURERS OF

WHITE AND COLORED COTTON **WARPS**

Nos. 6s to 30s,

On Beams, Jack Spools or in Chain

CONWAY, MASS.

GRANT YARN CO.,

COMBED AND CARDED COTTON.

YARNS 40s and above. AND

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E. JENCKES MFG. CO.

Colored Cotton Hosiery Yarns, Double and Twist Yarns for the Weaving Trade.

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Hughes Fawcett, 115 Franklin St., New York,

Flax, Hemp & Jute Line and Tow Yarns,

FOR WEAVING PURPOSES

Linen Jacquard Harness Twines.

Fine Cotton Harness and Heddle Twines.

For Cotton, Silk, Woolen and Carpet manufacturers. Correspondence solicited. Samples promptly furnished

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COTTON, **YARNS** WORSTED,

WOOLEN, AND SPUN SILK.

BRAIDS

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CAPACITY, 50,000 Spindles.

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COMBED OR CARDED

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In Chains and Skeins, on Balls, Beams, Spools—single or twisted.

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SPECIALTY—FIRE HOSE CORD and YARNS put up on tubes wound on Universal System.

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COTTON WARPS AND YARNS

In gray and all colors, single or in any twist.

COLORED COTTON

Machined, Carded or in Roving.

NOVELTY YARNS

In Cotton, Mercerized Cotton, Silk and Worsted, in various Patterns, Colors and Twists.
We are always pleased to assist our patrons of the Woolen Goods manufacture in special pattern warps for samples.
We use a uniform grade of long stapled cotton in all our manufacture.

will be sold in a business like manner. This wool cannot be bought as cheap now as it could before the failure. Regarding the Brown failure, the least said about it the better, but we hear many sad and curious stories going the rounds.

Fine Botany qualities are scarce and are much sought after. We believe we shall have a good business this coming year and spinners will be well employed.

Worsted Yarns: Spinners continue short of orders, but the prospect is for a good future business. The light weight season has been a failure, and the heavy weight business has not opened up, and will not before December 15th.

Weavers state that there is a good lookout for a good run on heavy weights; although buyers are in no hurry to place orders. After the election, spinners tried to advance prices, but with the result that it immediately checked orders. The belief is that the trend of the heavy weight season is toward finer yarns, provided prices be not advanced, but any attempt to advance prices on yarns will result in buyers again taking on cotton worsteds.

The buyers are very conservative in placing orders for yarn, and many of

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Colored and Bleached Yarns Furnished in any manner desired by the trade.
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WHITE AND COLORED WARPS,
6s to 50s—Single and Ply.
MULE COPS,
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Jacquard and Harness Twines.

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Spinners of
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346 Broadway, New York.

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WINDSOR LOCKS, CONN.
Manufacturers of
Mercerized Cotton Yarns. GIVES THE HIGH SILK-LIKE LUSTRE IN KNIT GOODS AND WOVEN FABRICS
Novelty Yarns. BOUCLE, BOURETTE AND SPIRALS, IN COTTON, WOOL, WORSTED, MOHAIR AND SILK.
Cotton Warps. ON BEAMS, JACK SPOOLS AND TUBES. IN FANCY TWIST COLORS AND PRINTED.

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Knit Underwear

SAMPLES FOR SPRING

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ARE READY AND ARE UNUSUALLY ATTRACTIVE

PROMPT DELIVERIES LOWEST PRICES

MONTHLY CAPACITY 30,000,000 YDS.

G. A. Schneebeli & Co.

NAZARETH, PA.

FLEMING & CHAPIN, 229 Church Street, Philadelphia, Selling Agents.

the spinners at present find it difficult to keep machinery going, and are anxious to get orders for present delivery.

There is undoubtedly a better inquiry and demand for yarn, but spinners can get no advance.

The coming season, the great demand will be still for 3/8 and 1/2 Blood yarn with the trend of the trade toward the finer grades.

The finer grades of yarn seem to be too high priced for the average mill, but as soon as values get more settled and with the declining position of fine wool, weavers will eventually get back to using 2/40s and 2/50s Australian yarn. In years past, weavers thought nothing of paying $1.10 to $1.20 per pound for these grades, and in no distant future, manufacturers will be on the market for these grades again, and the present counts of 2/28 to 2/30 will be discontinued.

We have had several interviews with users of worsted yarn to find what they considered the trouble with the worsted yarn business. One manufacturer told us that the trouble was that the spinners and manufacturers in general manufactured enough material in six months to last a year, and business has been held up until the buyers could get rid of the accumulated stocks.

He said we had orders to manufacture cloth, and we bought yarn to cover the amount of cloth sold. We still have the orders, and the spinner still has the orders for the yarn, but we have not ordered it in, as the buyers of the cloth have not ordered it in. We could buy the yarn 25 cents per pound less on today's market. That is the case with a great many mills.

We asked another manufacturer if he had felt the effect of the late election. He said he had not, but that was not strange as the present was the end of a most prosperous season, and the warm and unseasonable weather had much retarded business; but he said he was in a position to know just what laws he was to work under for the next 4 or 5 years, and he was looking ahead with confidence, and should place orders for yarn accordingly.

We hear some complaint from manufacturers of dress goods about the competition of old stocks which have been made up on speculation, which are competing against freshly made fabrics, and on which there

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CRANSTON WORSTED MILLS.

Worsted and Mohair Yarns — white or colors, in skeins, on spools, cones, or shuttle bobbins.

NOVELTY YARNS — of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making Yarns **only.**

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Worsted Spinners.

Yarns, both French System and Bradford.

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All Numbers to 60s.

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MANUFACTURERS OF

Novelty Yarns, Silk Noil Yarns, in Fast Colors AND White.

Mills, Frankford, Pa. Office, 239 CHESTNUT ST., PHILA.

seems to be no fixed price. The top combers are slack at present, but are anticipating a better business as soon as spinners get started again. It is noted in connection with tops that there were spinners who contemplated buying tops as far back as last April, who have not yet placed orders, and tops have been sold in the coarser grades at a price less that what the wool can be bought for.

Philadelphia Cotton Yarn Market.

The extreme and violent fluctuations in cotton are making it very hard for both spinners and customers to do business. Spinners are obliged to take orders extending over next summer, and to do so, have to buy cotton now, against these orders.

We believe business men generally, would welcome the abolition of the Cotton Exchange of New York and Liverpool, when they consider the trouble that speculators are making them this year.

The demand is not particularly active, but deliveries continue in fair volume.

Prices are held generally firm and it is believed there is not much accumulation of stock in the knitting trade.

The following are about market values:—

Southern Frame Cones:—

8s and coarser	16 to 17
9s and 10s	17 to 18
14s	18 to 18½
18s	19 to 19½
22s	20 to 20½
24s	21 to 21½
30s	23 to 24
40s	30 to 31

We understand that 20s, 22s and 24s are sold in some inferior qualities lower than these prices.

SILK NOILS AND SILK NOIL YARNS
IN WHITE AND COLORS.
MOHAIR LOOPS, KNOTS, AND FANCY YARNS FOR DRESS GOODS AND CLOAKINGS.
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FOR WEAVING AND KNITTING.
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TWINES, THREADS AND YARNS.
Jacquard Harness Twines of all kinds on hand and made to order.
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Philadelphia Wool Scouring
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Fine AUSTRALIAN NOILS a Specialty.
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Dyers, Bleachers and Mercerizers of Warps and Skein Dyeing.

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Dyers of All Kinds of Yarn and Cotton Warps.

Calculations in Yarns and Fabrics.

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Various Systems of Counting Yarns; Resultant and Average Counts; Relative Weights and Cost of Twist and Mixture Yarns; Weights and Cost of Warp and Weft; Sett Systems; Weight and Cost of Woven Fabrics; Reproduction of Woven Fabrics; Conditioning; Construction of Woven Fabrics; Exercises with Answers. Over 200 pages. Full bound in cloth

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COTTON YARNS, Suited for HOSIERY and WEAVING Cotton, Woolen and Worsted DRESS GOODS, Woolen and Worsted Mixed CASSIMERES and CLOAKINGS, also Woolen and Worsted Slubbing, COTTON YARN and WARP DYERS and BLEACHERS.

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BLEACHERS

Of Turkish Towels, Cotton Yarns, Underwear, Tapes and Hosiery.
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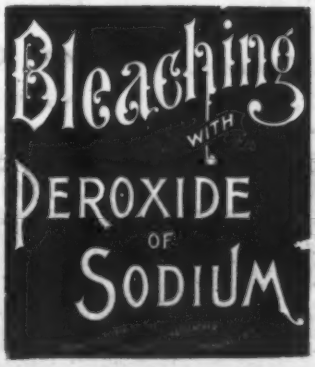

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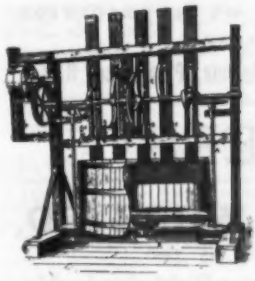

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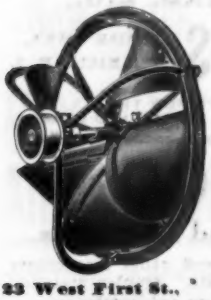

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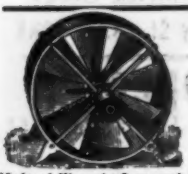

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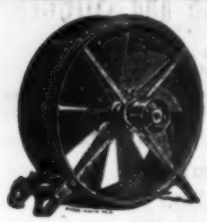

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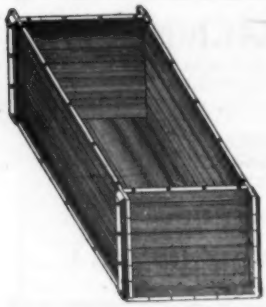

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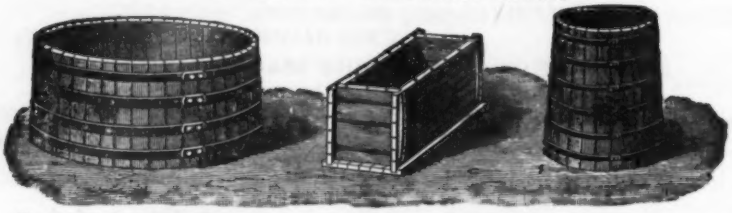

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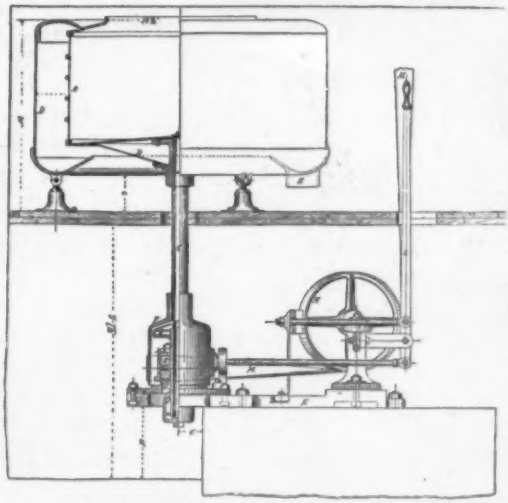

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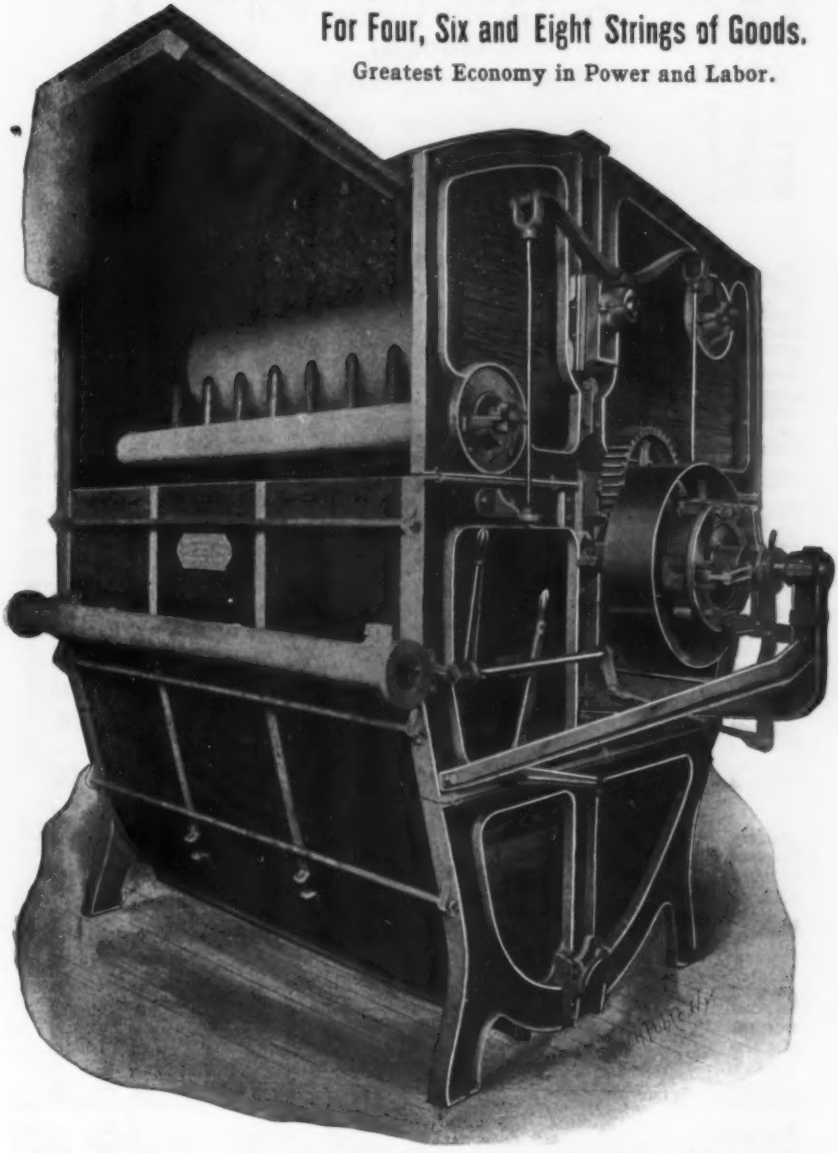

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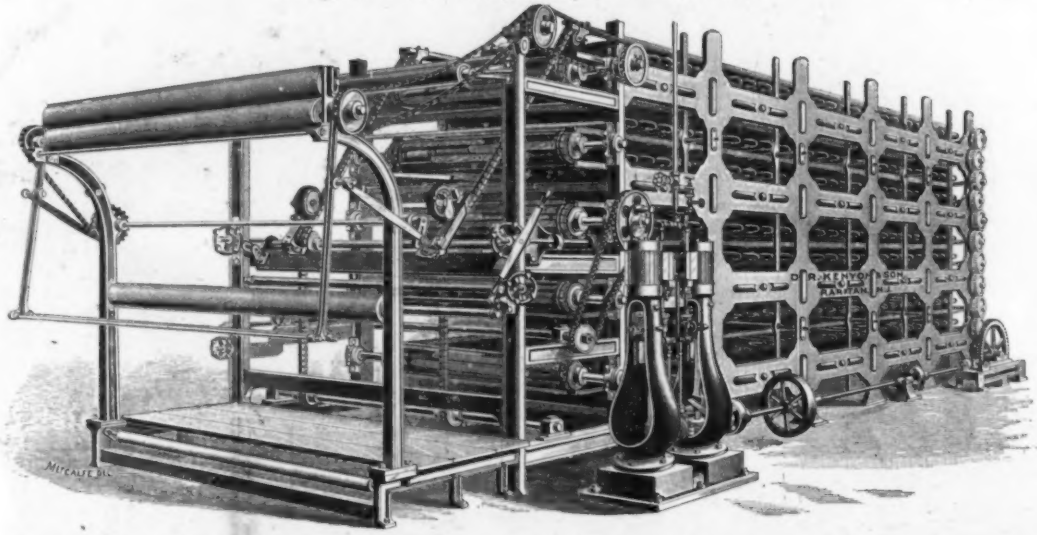

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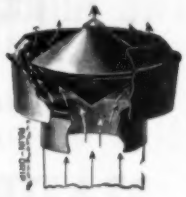

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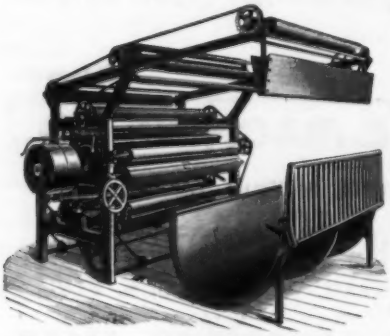

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For Wool Scouring, Benser Boxes and Dyers of Raw Cotton.
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THE INVINCIBLE

FULL AUTOMATIC KNITTING MACHINE

IS ADAPTED TO THE ECONOMICAL PRODUCTION OF ALL CLASSES OF SEAMLESS HOSIERY.

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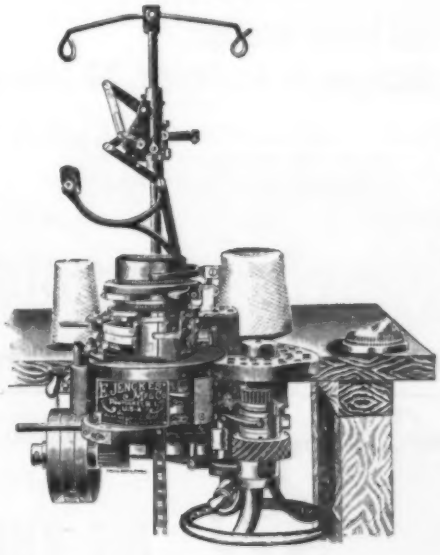
It is the only full automatic machine made to be fastened to a bench, occupying no more space than semi-automatic machines.



• • •

It has a simple and positive attachmen for putting in and taking out an extra thread in heel and toe automatically.

• • •

• • •

A simple and positive attachment can be applied for **making high spliced heels and double soles automatically,** at the same time the heel and toe are reinforced by an extra thread. The splicing arrangement is supplied with yarn from a bobbin holding a quantity of yarn, and not from a small cop such as is usually used in devices of this kind.

The only successful yarn changer is applied to this machine. This device changes the yarn automatically at heel and toe, or at any desired point in the knitting of the stocking. It does not require a revolving bobbin which is commonly used in similar devices, but allows the use of a full size winder bobbin or cone for each yarn used. It is perfectly positive in its operation, is simple and well built, and is recommended as filling a popular demand.

In knitting "string work," **a loose course** is put in as a guide for cutting off each stocking. **A loose course can be be put in for looping** the toes. This is a great advantage in fine gauges.

Attention is invited to the new method of transferring tops to the needles of machine in knitting Half Hose, and in footing ribbed leg hose.

The method of doing this is entirely new, and must not be confounded with the ordinary method of transferring with a quilling.

The speed of the machine is reduced just before changing from circular to reciprocatory knitting, thus avoiding all shock. All parts are interchangeable.

By changing cylinders only, the machine will make either fine or coarse gauge of goods.

The Invincible is a compact, light running, full automatic machine, simple in construction, has few parts, runs at high speed, occupies small space, and is put upon the market at a price that defies competition from either full or semi-automatic machines.

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Men's Underwear, Sweaters, etc.

New Improved Sleeve Machines.
Machines for Rib Hosiery, Rib Tops and Cuffs.

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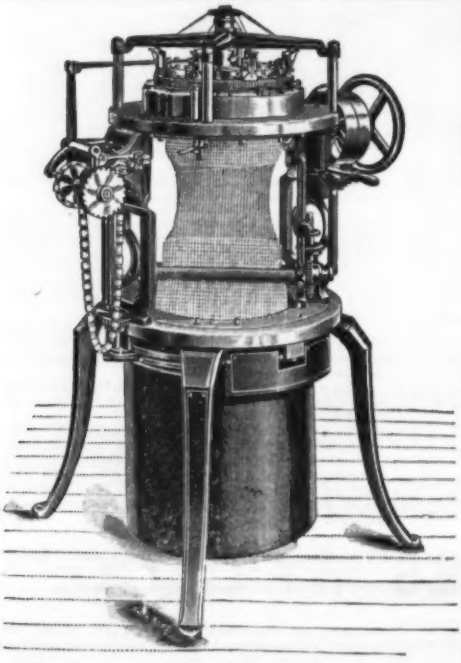

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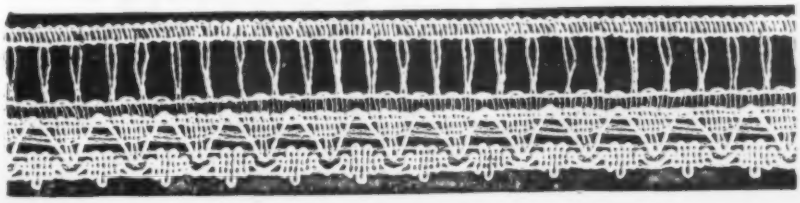

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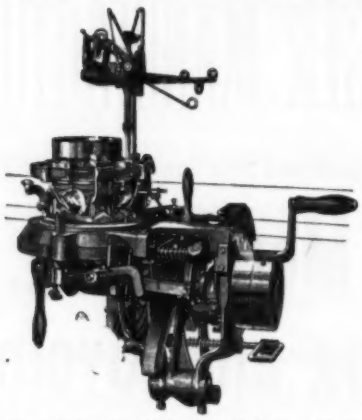
FOR SEAMLESS HOSIERY.

Hand or Power,

Open Top or Hold Down.

One-half, Three-Fourth or



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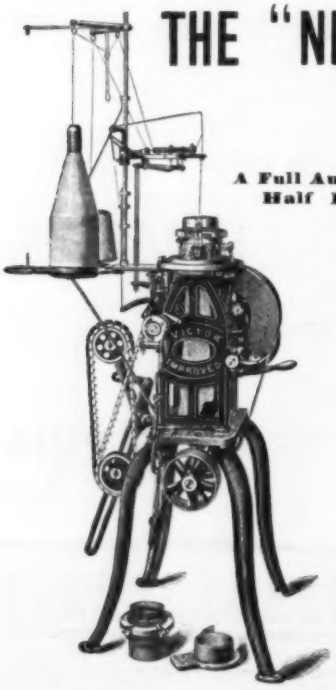

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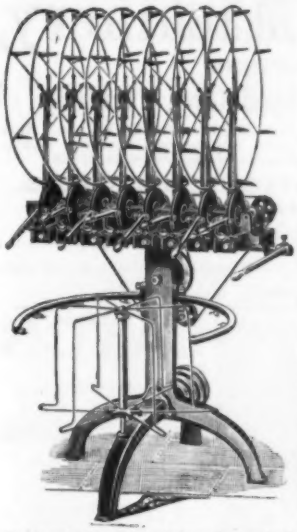

Back-winding Machine for winding the yarn from imperfect pieces back into skeins.

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UNEXCELLED MACHINERY FOR RIBBED UNDERWEAR,

Sweaters, Bathing Suits, Toques and Specialties, with or without Automatic Stripers and Designers.

These machines have the **only absolutely perfect Take-up Device** Depends neither on springs, friction, ratchet, nor state of weather for its efficiency.

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CIRCULAR RIB KNITTING MACHINES,

Carefully designed and well made with Solid Forged Steel Cylinderr and Dials, Segmental Cam Rings, Encased Take-up, Stop Motions, etc. Standard Sizes, Reasonable Prices. Also

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ESPECIALLY FOR THE **Knit Goods Trade.**

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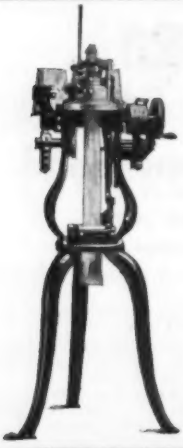

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Pepper's Flat-Ribbed Cuff Machine,

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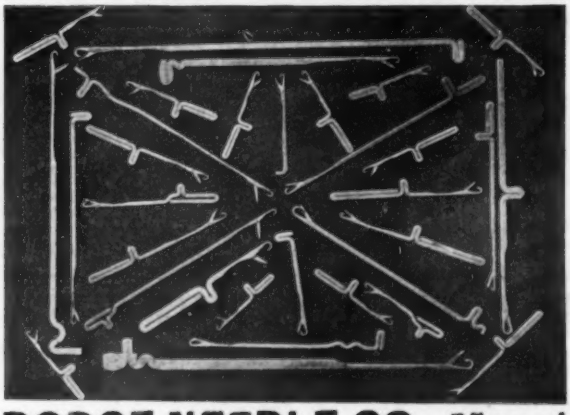

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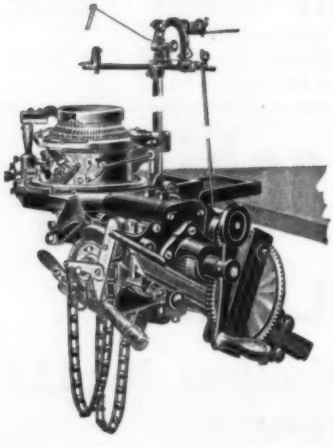

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7-8 AUTOMATIC KNITTERS,

Adapted for Ladies' Plain Hose, Men's Half Hose or footing Ribbed Hose.

Its Production is Greater than any 7-8 or full Automatic Machine now on the market.

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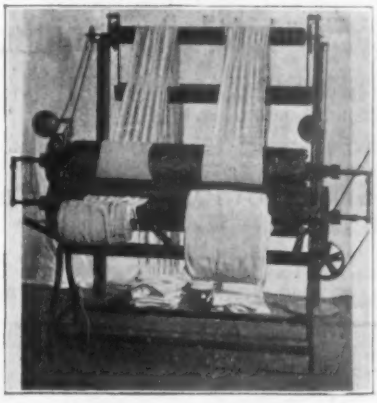

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Automatic Knitter,

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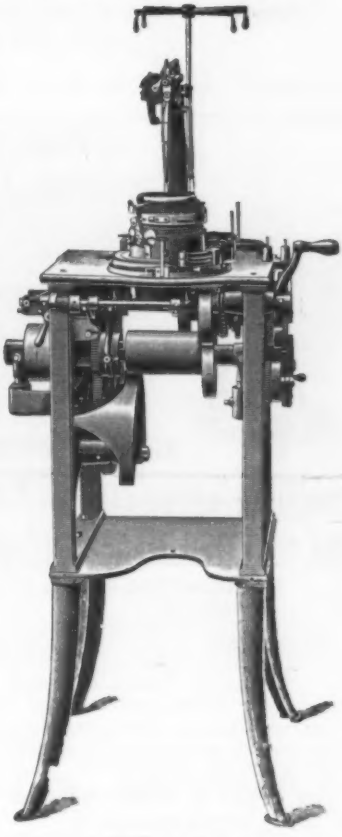

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Over 1000 machines now in operation.
Just now we are making a speciality of 14 and 16 feed machines for stripes.

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GAS ENGINES for city or country.	EFFICIENT
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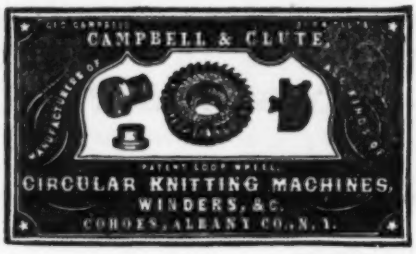

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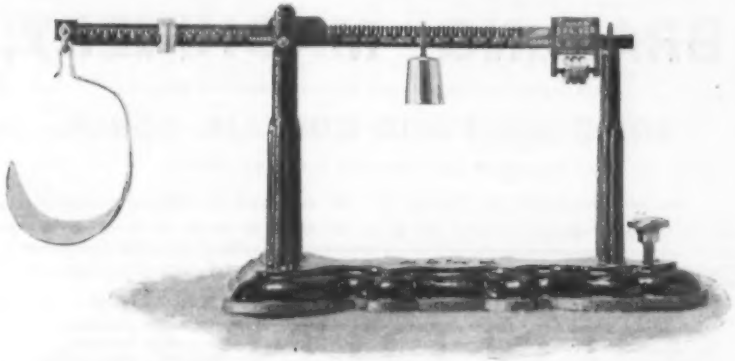
That will weigh by HALF GRAINS up to 1,000 GRAINS (over 2 1-4 oz.)



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We make Scales of Every Description.

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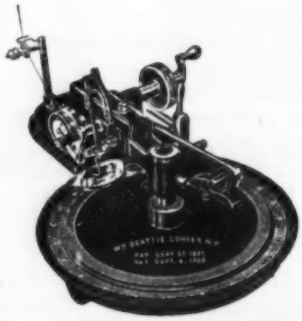

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The best hosiery needle in the market.
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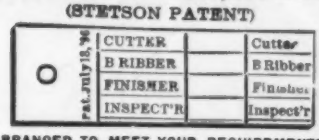
(STETSON PATENT)



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E. H. FOSTER & CO.
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Our New Improved Light-Running Short Carriage
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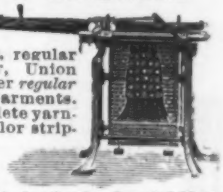

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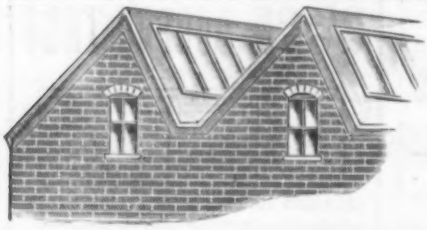

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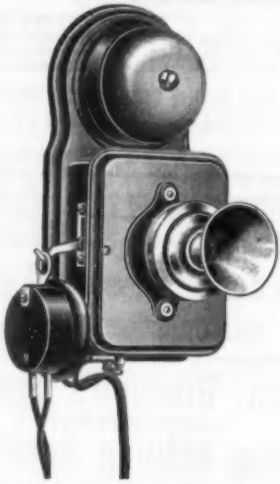

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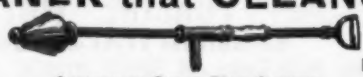

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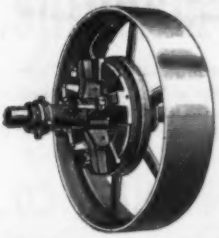

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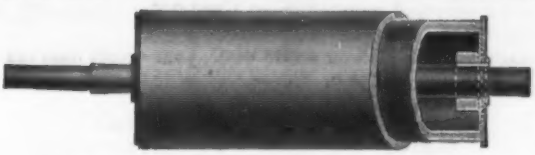

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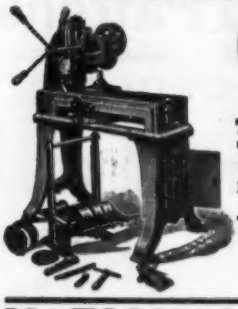

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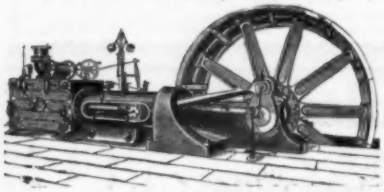

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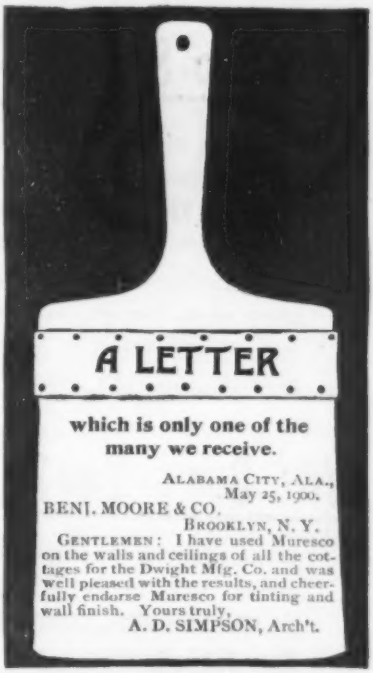

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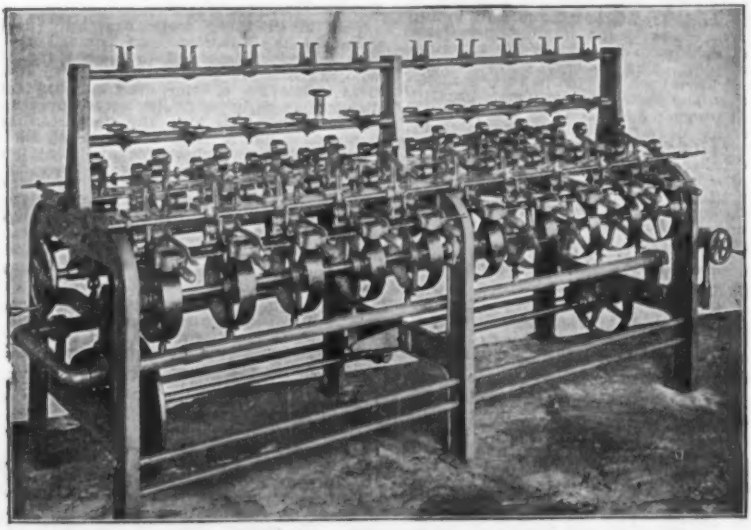

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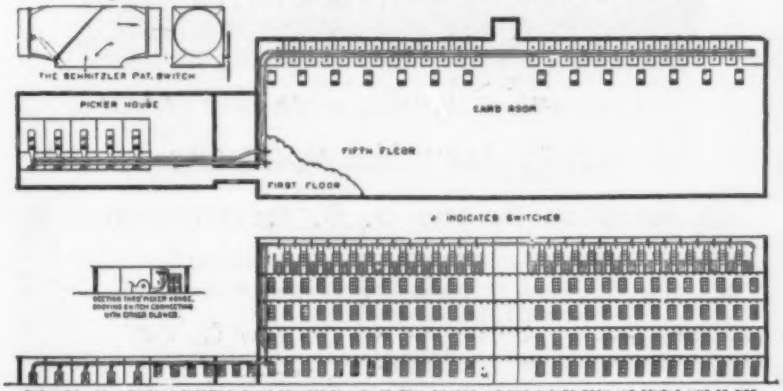

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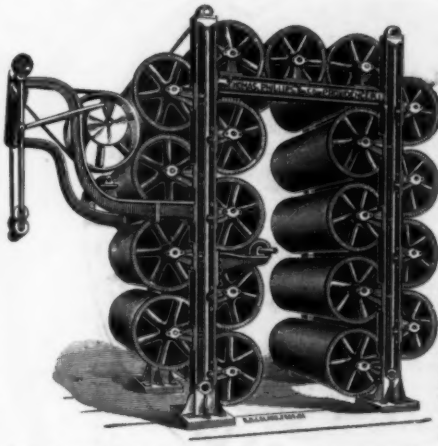

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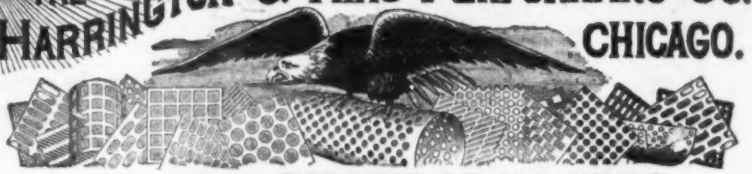

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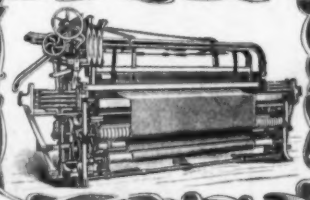

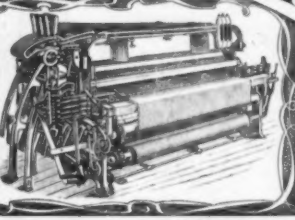

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